

City Of Clarksburg, West
Virginia
Firemen's Pension and
Relief Fund

**Actuarial Valuation Report
for the Year Beginning July 1, 2017**



September 10, 2018

Ms. Kimberly A. Karakiozis
Finance Director
222 West Main Street
Clarksburg, WV 26301

Lt. Gino M. Gallo
Pension Board Secretary
City of Clarksburg Firemen's Pension and Relief Fund

**Subject: City of Clarksburg Firemen's Pension and Relief Fund
Actuarial Valuation Report for the Year Beginning July 1, 2017**

Dear Ms. Karakiozis and Lt. Gallo:

Upon the request of the Municipal Pensions Oversight Board, we have performed an actuarial valuation as of July 1, 2017, for the City of Clarksburg, West Virginia Firemen's Pension and Relief Fund ("Fund" or "Plan"). This actuarial valuation has been performed in accordance with the West Virginia Code Chapter 8, Article 22, Sections 16 through 28, inclusive.

In accordance with West Virginia Code §8-22-20, this actuarial valuation report provides information on:

- The sponsor's funding requirements for the fiscal year ending June 30, 2019, based on the selected funding policy, i.e. the Alternative funding policy as defined in West Virginia Code §8-22-20(c)(1)
- The Fund's eligibility to receive an allocation of the premium tax for the fiscal year ending June 30, 2019
- The Fund's eligibility to provide supplemental benefits for the plan year beginning July 1, 2019

This report also provides illustrative projections under two other funding policies available to the sponsor – the Optional funding policy as defined in West Virginia Code §8-22-20(e), and the Conservation funding policy as defined in West Virginia Code §8-22-20(f).

West Virginia Code §8-22-20 (c)(4), requires (1) a review of the actuarial assumptions and methods at least once every five years and (2) that the Actuary shall provide a report to the oversight board with recommendations on any changes to the actuarial process. Consequently, an experience review was performed for the period July 1, 2009, through June 30, 2014. The assumptions and methods were recommended by the actuary, in the report *2016 Experience Review for the Years July 1, 2009, to July 1, 2014*, approved by the Municipal Pensions Oversight Board, and became effective for the actuarial valuation as of July 1, 2015.

This actuarial valuation is based upon:

Plan Member Data – Data for active members and persons receiving benefits from the Fund as of June 30, 2017, was provided by the Fund's staff. We have tested this data for reasonableness.

Asset Values – A reconciliation of market value of assets during the plan year ended June 30, 2017, and a list of assets held as of June 30, 2017, by investment category, were provided by the Fund.

Plan Provisions – A summary of the key plan provisions valued are set forth in Section VII of the report: Summary of Principal Plan Provisions.

Actuarial Methods – Fund liabilities were measured using the Entry-Age Normal Actuarial Cost Method. The actuarial valuation was based on the market value of assets. The actuarial methods used in the actuarial valuation are set forth in Section VI of the report: Actuarial Assumptions and Methods.

Actuarial Assumptions – The actuarial assumptions used include a discount rate of 5.00%. The actuarial assumptions used in the actuarial valuation are set forth in Section VI of the report: Actuarial Assumptions and Methods.

The actuarial valuation results disclosed in this report are based on the data and actuarial assumptions and methods described above, and upon the provisions of the Plan as of the actuarial valuation date. Based on these items, we certify these results to be true and correct.

To the best of our knowledge, this actuarial statement is complete and accurate, and has been prepared in accordance with generally accepted actuarial principles and practices.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law.

This report should not be relied on for any purpose other than the purpose stated.



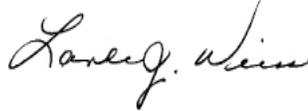
The signing actuaries are independent of the plan sponsor.

Alex Rivera and Lance J. Weiss are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein.

Sincerely,



Alex Rivera, FSA, EA, MAAA, FCA
Senior Consultant



Lance J. Weiss, EA, MAAA, FCA
Senior Consultant

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SECTION I

ACTUARIAL VALUATION RESULTS AS OF JULY 1, 2017

Executive Summary

Upon the request of the Municipal Pensions Oversight Board (MPOB), we have performed an actuarial valuation as of July 1, 2017, for the City of Clarksburg, West Virginia Firemen's Pension and Relief Fund ("Fund" or "Plan").

In accordance with West Virginia Code §8-22-20, this actuarial valuation report provides information on:

- The sponsor's funding requirements for the fiscal year ending June 30, 2019
- The Fund's eligibility to receive an allocation of the premium tax for the fiscal year ending June 30, 2019
- The Fund's eligibility to provide supplemental benefits for the plan year beginning July 1, 2019

This report is based on the sponsor's election to finance benefit obligations using the Alternative funding policy as defined in West Virginia Code §8-22-20 (c)(1).

The key features of the Alternative funding policy, effective as of June 30, 1991, are summarized below:

- The sponsor's initial Alternative contribution effective for plan year 1991 is the greater of 107% of the amount contributed for the plan year ended June 30, 1990, or the highest five-year average of contributions made since 1984.
- Sponsor contributions made in subsequent years cannot be less than 107% of the contribution made in the prior fiscal year.
- The actuary must certify in writing that the Fund is projected to be solvent under the Alternative funding policy for the next consecutive 15-year period. A plan is deemed to be solvent if projected assets are greater than zero over the 15-year projection period.
- Beginning September 1, 2003, any municipality which elected the Alternative funding policy has the option of reverting to the Standard funding policy if the plan's funded ratio is greater than 80%. In this case, the Standard minimum contribution equals the normal cost plus the amortization of the unfunded liability over a period of not more than 40 years commencing from July 1, 1991, less the allocable portion of the state premium tax fund for municipal pension and relief funds.
- Plan members hired before January 1, 2010, contribute 7.0% of pay; however, if elected by the Board of Trustees of the Plan, member contributions may be increased up to 9.5% of pay. Employees hired on or after January 1, 2010, contribute 9.5% of pay.
- The Plan also receives premium tax allocation assigned to the Fund for the plan year.

This report also provides illustrative projections under two other funding policies available to the sponsor – the Optional funding policy as defined in West Virginia Code §8-22-20(e), and the Conservation funding policy as defined in West Virginia Code §8-22-20(f).

The sponsor made a contribution of \$1,345,298 for the fiscal year end June 30, 2017. The sponsor's minimum statutory contribution for fiscal year 2017 was \$949,252, based on the Alternative funding contribution in the July 1, 2016 valuation report. The additional contributions in excess of the statutory minimum slightly improved the funded status of the pension fund.

Executive Summary (Continued)

The following table provides the Plan's funded status:

Funded Status as of:	July 1, 2017
Assets	\$6,944,559
Actuarial Accrued Liability	\$32,233,592
Unfunded Actuarial Accrued Liability	\$25,289,033
Funded Ratio	21.54%

The following table provides the employer contributions for the fiscal year ended June 30, 2018, under the Alternative funding policy:

Employer Contributions for FYE:	June 30, 2018
FYE 06/30/2017 Alternative Contribution	\$949,252
7% Increase in Alternative Contribution	\$66,448
FYE 06/30/2018 Alternative Contribution	\$1,015,700
Additional Contribution	\$0
Final FYE 06/30/2018 Alternative Contribution	\$1,015,700

The following table provides the estimated employer contributions for the fiscal year ending June 30, 2019, under the Alternative funding policy:

Estimated Employer Contributions for FYE:	June 30, 2019
FYE 06/30/2018 Alternative Contribution	\$1,015,700
7% Increase in Alternative Contribution	\$71,099
FYE 06/30/2019 Alternative Contribution	\$1,086,799
Additional Contribution to satisfy 15-year Solvency Test on an Open Group Basis (to receive 100% of the State Premium Tax Allocation)	\$0
Estimated Employer Contribution for FYE 06/30/2019 to receive 100% of the State Premium Tax Allocation	\$1,086,799
Additional Contribution to satisfy 15-year Solvency Test on a Closed Group Basis (to grant Supplemental Benefits; i.e. COLA increases)	\$0
Estimated Employer Contribution for FYE 06/30/2019 to receive 100% of the State Premium Tax Allocation and to grant Supplemental Benefits; i.e. COLA increases	\$1,086,799

Executive Summary (Continued)

A sponsor using the Alternative funding policy must satisfy the solvency test, as referenced in West Virginia Code section §8-22-20 (c)(1) in order to receive 100% of the State premium tax allocation, or grant Supplemental Benefits to plan members. We understand that the minimum requirement to satisfy the statutory solvency test includes a demonstration that the assets are projected to be greater than zero over a 15-year period. The statutes also require that an actuary perform the projection and certify the solvency test. However, the statutes provide little guidance on the parameters used to perform the solvency projections.

Under the current minimum statutory requirements, a sponsor of a poorly funded plan could provide Supplement Benefits to members, effectively deplete assets over a 15-year period, and have no available assets reserved to pay the benefits of current or future retirees after the 15-year period. For this reason, we recommend performing projections that include a margin for conservatism and satisfy the minimum statutory requirement for solvency. For this purpose we recommend performing projections that assume contributions for members hired after the actuarial valuation date will not be used to finance the unfunded liabilities of current members as of the actuarial valuation date. That is, assets and liabilities associated with new plan members are excluded from the solvency projections used to certify the solvency test for purposes of providing Supplemental Benefits. In this report projections that exclude new members are called “Closed Group Projections.”

The statutes also require that the Plan satisfy the solvency test in order to receive the State premium tax allocation. For this purpose we recommend using less conservatism in the projections in order to ensure that the Plan receives the greatest allowable State premium tax allocation. A projection that includes assets and liabilities for members hired after the actuarial valuation would be less conservative. In this report projections that include new members are called “Open Group Projections.”

The sponsor is projected to satisfy the 15-year solvency test without making additional annual contributions in excess of the minimum alternative contribution.

Executive Summary (Continued)

Commentary on Premium Tax Allocation

Under §8-22-19 of the West Virginia Code, the plan sponsor is required to deposit the statutory contribution on a monthly basis at a rate of one-twelfth of the annual requirement, in order to receive the premium tax allocation from the Municipal Pensions Security Fund. Revenues which are specifically collected for the Fund, including employee payroll contributions, must be deposited within five days of receipt.

Based upon discussions with the MPOB, we understand the annual premium tax allocation is determined by September 1st each year. Municipalities can begin invoicing the MPOB for their share of the premium tax allocation after receiving their state provided actuarial study and after the municipality has made employer contributions to the local Plan. Each municipal treasurer shall use the invoice template provided by the MPOB to begin drawing down the state allocation for the municipal pension plan. This July 1, 2017, Actuarial Report from GRS is to be used by municipal pension plans to draw down the September 1, 2018 State Premium Tax Allocation which is allocated in Fiscal Year 2019. The actuarial valuation and projection results assume the sponsor will make the statutory contributions on a monthly basis in accordance with statutes, including any additional amounts needed to satisfy the 15-year solvency test on an open group projection basis, and will be eligible to receive the premium tax allocation.

Commentary on Solvency Projections and Supplemental Benefits

Under § 8-22-26a of the West Virginia Code, all retirees, surviving spouses, and disabled pensioners are eligible for Supplemental Benefits that include automatic cost-of-living benefits commencing on the first day of July following two years of retirement. The benefit equals the percentage increase in the Consumer Price Index, limited to 4.0 percent (2.0 percent for certain disabled pensioners), multiplied by the sum of the allowable amount (first \$15,000 of initial benefits paid) and the accumulated supplemental pensions paid in prior years.

The Court of Appeals decision requires that Supplemental Benefits be provided on “the allowable amount of the first \$15,000 of the total annual pension paid in addition to the accumulated supplemental pension from the previous years.” The decision implies that compound cost-of-living increases should be applied to both the allowable amount of \$15,000 and the accumulated supplemental pension amounts for prior years. Additional Supplemental Benefits are payable only if the Plan satisfies the minimum standard for actuarial soundness as defined in West Virginia Code § 8-22-20. This minimum standard requires that the fund remain “solvent” over the next 15-year projection period. Based on discussions with the West Virginia Municipal Pensions Oversight Board, and our understanding of the administrative practices of other local police and fire pension funds in West Virginia, the “solvency” requirement generally means that the fund’s market value of assets is projected to be greater than zero for all plan years prior to the end of the 15-year projection period. The projection is based on the most recent actuarial valuation and assumes the plan sponsor will make contributions according to the funding policy elected by the sponsor as defined by West Virginia Code, including any additional amounts needed to satisfy the 15-year solvency test on a closed group projection basis. Although the 15-year solvency test may satisfy the minimum standard for actuarial soundness under the statutes, it is not necessarily consistent with generally accepted actuarial principles.

Executive Summary (Continued)

The Supplemental benefits for plan year beginning July 1, 2019 will be based on the Consumer Price Index for calendar year 2018, and the projected results of the July 1, 2017 actuarial valuation.

Additional Remarks on the Actuarial Valuation Results

Following are additional remarks on the actuarial valuation results as of July 1, 2017:

- The actuarial assumptions and methods were recommended by the actuary, in the report *2016 Experience Review for the Years July 1, 2009, to July 1, 2014*, and approved by the Municipal Pensions Oversight Board and became effective beginning with the actuarial valuation as of July 1, 2015. The key actuarial assumptions are fully disclosed in Section VI of the report.
- The interest rate used to discount liabilities remained the same for the July 1, 2016 and July 1, 2017 actuarial valuations.
 - The interest rate assumption was developed by reviewing the Plan's current funded ratio, the 15-year projected funded ratio, the ratio of assets to benefits, the percentage of assets allocated to equities and the funding policy selected. The details of the methodology used to select the discount rate are presented in Section VI of the report. As of July 1, 2017, the Plan's funded ratio of 23% (using a testing interest rate of 5.50% for all plans using the Alternative funding policy), ratio of assets to benefits of 5.50, equity allocation of 56%, and 15-year projected funded ratio of 58%, resulted in a discount rate assumption of 5.00%.
- The Fund experienced an approximate annualized return of 9.64% on the market value of assets during the plan year ended June 30, 2017, which compares to the expected annualized return of 5.00%. The difference in actual versus expected return produced an asset (gain)/loss of (\$278,292).
- An actuarial valuation is based on the expectation of certain events such as salary increases, retirement, disability, mortality, termination, and cost of living increases. Demographic or liability experience (gains)/losses are generated when the actual occurrence of such events differs from the expectation. During the plan year ended June 30, 2017, the fund experienced a net liability (gain)/loss of (\$1,021,001) due to these events.

Alternative Funding

Following are additional remarks on the actuarial valuation projections under the current funding policy.

Based on the open group projections shown in Table 2, page II-2 and assuming that the sponsor makes the statutory required contributions, if all actuarial assumptions are realized in the future, including an investment return of 5.00%:

- The funded ratio is projected to increase from 22% at June 30, 2017, to 31% at June 30, 2024, to 55% at June 30, 2033, and then increase to 100% at 2042.
- Employer contributions are expected to increase from \$1,015,700 (or 53% of pay) for the fiscal year end June 30, 2018, to \$4,814,948 (or 113% of pay) for fiscal year end June 30, 2041.

Please note that a funded ratio of only 22% at June 30, 2017, means that the plan is underfunded.

Executive Summary (Continued)

The Alternative funding policy is not consistent with generally accepted actuarial principles because it does not recognize emerging gains or losses.

A funding policy consistent with generally accepted actuarial principles is typically based on the sponsor contributing the normal cost net of employee contributions plus an amortization of the unfunded actuarial accrued liability. The annual amortization amount is generally 6% to 7% of the unfunded actuarial accrued liability. Under state statute, the annual premium tax allocation can only be used to finance the amortization of the unfunded actuarial accrued liability. For fiscal year end 2019, the Alternative funding policy contribution of \$1,086,799 is sufficient to finance 100% of the net employer normal cost of \$776,009 and only 1.2% of the unfunded liability of \$25,289,033. The state premium tax allocation of \$446,391 is sufficient to finance only 1.8% of the unfunded actuarial accrued liability of \$25,289,033.

This actuarial valuation assumes that the City will be able to make future contributions on a timely basis. The ability of the plan to become funded is heavily dependent on the City contributing the minimum employer contribution calculated under the Alternative funding policy for each and every future year. We did not perform an analysis of the ability of the City to make future contributions. Such an analysis is not within the scope of our assignment or within our analytical skill set. Failure to receive City contributions on a timely basis could jeopardize the sustainability of the Fund.

Please understand that minimum employer contribution calculated under the Alternative funding policy as defined in West Virginia Code 8-22-20 (c)(1) is just that – the minimum that needs to be contributed each and every year. Because this is an underfunded plan, we continue to recommend that the plan sponsor consider making additional contributions (in excess of the minimum requirement) to ensure that there are sufficient assets available in the fund in all years to pay the promised benefits.

If the minimum employer contributions (calculated under the Alternative funding policy) are not made or investment return is less than the assumption of 5.00%, the funded ratio will be lower and the cash flow strain could be higher. If another significant market downturn occurs while the plan's funded ratio is declining, the plan may need to liquidate assets in order to pay benefits which could have a further adverse effect on the funded status of the System.

Under the Alternative funding policy, City contributions increase by seven percent and do not change as a result of emerging actuarial experience. However, emerging experience gains and losses could impact the Plan's funded ratio as follows:

- If the actual return on assets is *less* than the assumed return of 5.00%, then contributions will generally *increase*. Conversely, if the actual return is *greater* than the assumed return, contributions will generally *decrease*.
- If salaries *increase* by more than assumed, contributions could *increase*. If salaries *decrease* by more than assumed, contributions could *decrease*.
- If active members retire *sooner* than expected, contributions will generally *increase*. If active members retire *later* than expected, contributions will generally *decrease*.
- If active members become disabled during the year, contributions could increase.

Executive Summary (Continued)

- If retired members die *later* than expected, contributions will increase. If retired members die *sooner* than expected, contributions will decrease.
- If the general inflation is *greater* than assumed, supplemental benefits will be greater than assumed and contributions will *increase*. Conversely, if general inflation is *lower* than assumed, contributions will *decrease*.

At least once every five years, GRS performs an experience review analysis and updates the actuarial valuation assumptions. For example, if salary increases were consistently lower than assumed during the experience period, then the salary increase rate would likely be lowered. Or if more members retired than assumed, then the retirement rates would likely be increased. Any change in actuarial assumption will also impact the City's funded ratio. The objective of a change in assumptions is to reduce the level of experience gains and losses in future actuarial valuations.

Schedule A: Summary of Key Valuation Results

Valuation Date	July 1, 2016	July 1, 2017
Valuation Interest Rate	5.00%	5.00%
Cost-of-Living Adjustment	2.75%	2.75%
Wage Inflation	3.75%	3.75%
Expected Payroll	\$1,919,071	\$1,912,017
Average Pay	\$45,692	\$45,524
Expected Benefit Payments	\$1,253,390	\$1,262,180
1. Actuarial Accrued Liability	<u>No.</u>	<u>No.</u>
(a) Actives	42	42
(b) Retirees	29	29
(c) Survivors	18	17
(d) Disabled Members	6	5
(e) Deferred Vested Members	0	0
(f) Total	95	93
	\$13,753,381	\$14,474,176
	\$13,468,693	\$13,265,806
	\$2,803,670	\$2,630,001
	\$1,947,561	\$1,863,609
	\$0	\$0
	\$31,973,305	\$32,233,592
2. Present Value of Future Normal Costs	\$8,083,166	\$7,624,219
3. Present Value of Benefits (1(f) + 2)	\$40,056,471	\$39,857,811
4. Market Value of Assets	\$5,649,638	\$6,944,559
5. Unfunded Actuarial Accrued Liability (1(f) - 4)	\$26,323,667	\$25,289,033
6. Funded Ratio (4 / 1(f))	17.67%	21.54%
7. Net Employer Normal Cost		
(a) Normal Cost	\$913,372	\$911,837
(b) Administrative Expenses	\$6,165	\$7,706
(c) Gross Normal Cost (a + b)	\$919,537	\$919,543
(d) Employee Contribution Rate ^a	7.45%	7.51%
(e) Expected Employee Contributions	\$142,990	\$143,534
(f) Net Employer Normal Cost (c - e)	\$776,547	\$776,009
(% of Compensation)	40.46%	40.59%
	FYE 2018	FYE 2019
8. Estimated Minimum Employer Contribution ^b		
(a) Prior Year Alternative Contribution	\$949,252	\$1,015,700
(b) Increase in Alternative Contribution	7.00%	7.00%
(c) Current Year Alternative Contribution	\$1,015,700	\$1,086,799
(d) Additional Contribution	\$0	\$0
(e) Alternative Contribution (c + d)	\$1,015,700	\$1,086,799

^a Blended rate reflecting 7.0% for members hired before January 1, 2010, and 9.5% for members hired after January 1, 2010.

^b Estimated Minimum Employer Contribution is based on Alternative funding policy and is assumed to be made in plan year ending June 30, 2019.

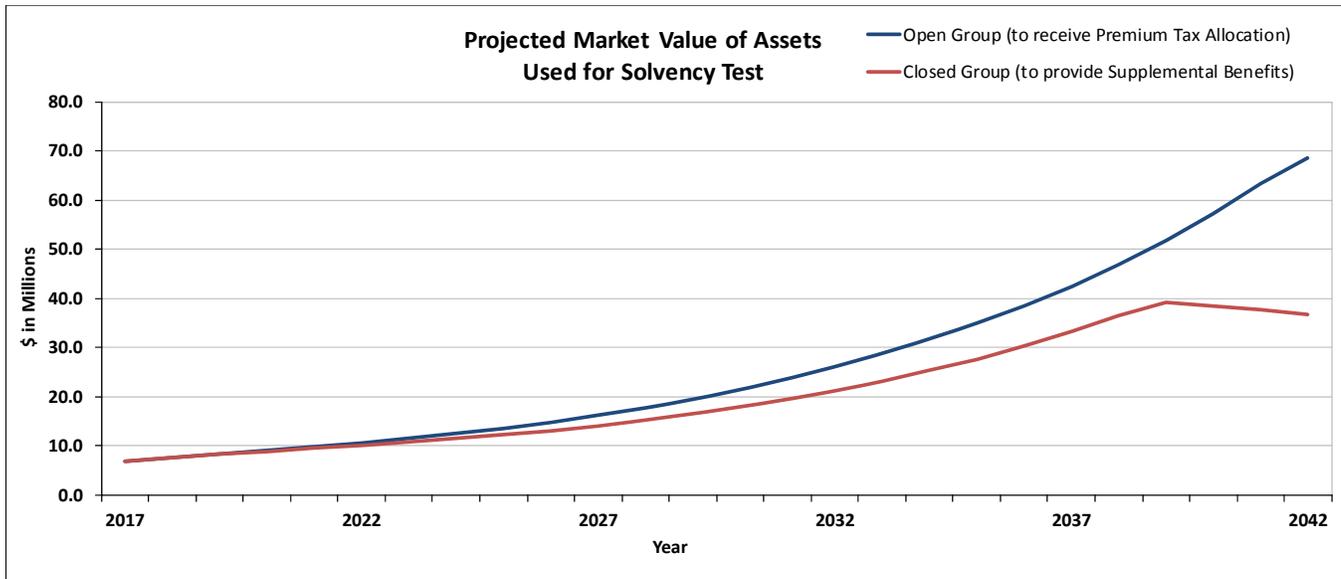
Schedule B: (Gain)/Loss Analysis

Experience (Gain)/Loss for Plan Year Ended June 30, 2017

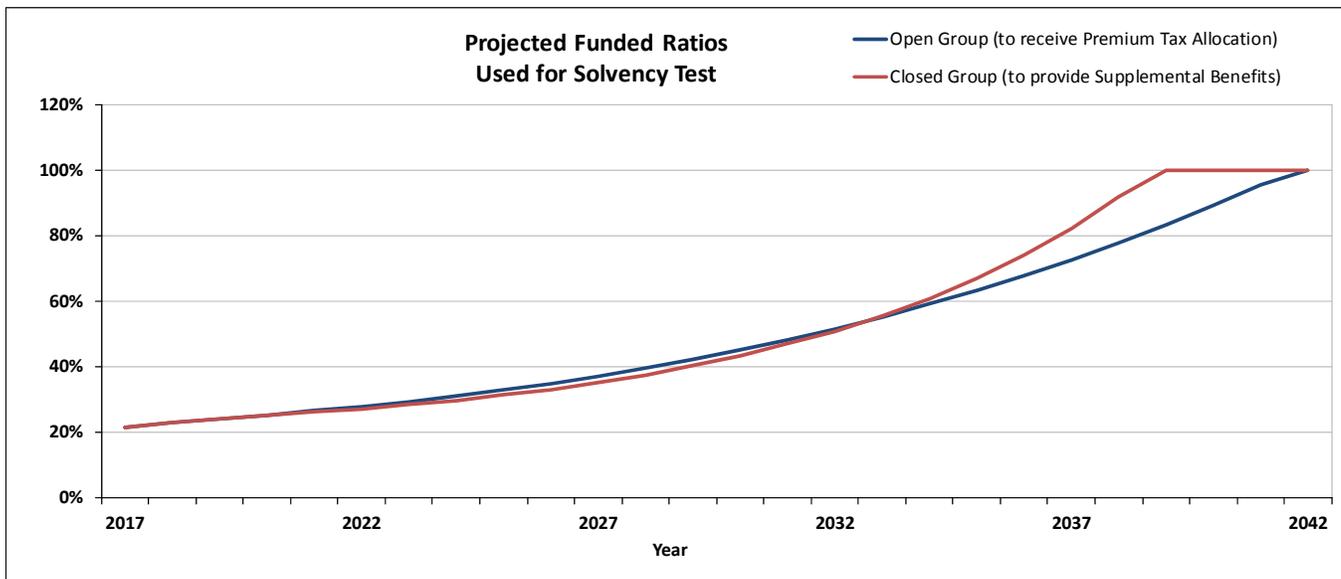
1. (a) Actuarial Accrued Liability as of 7/1/2016	\$31,973,305
(b) Normal Cost due 7/1/2016	\$913,372
(c) Interest on (a) and (b) to 6/30/2017	\$1,621,500
(d) Benefit Payments with interest to 6/30/2017	\$1,253,584
(e) Effect of Assumption Changes	\$0
(f) Expected Liability at 7/1/2017 [(a) + (b) + (c) - (d) + (e)]	\$33,254,593
(g) Actual Liability at 7/1/2017	\$32,233,592
(h) Liability (Gain)/Loss [(g) - (f)]	(\$1,021,001)
2. (a) Market Value of Assets as of 7/1/2016	\$5,649,638
(b) Interest on (a) to 6/30/2017	\$282,482
(c) Contributions with interest to 6/30/2017	\$1,987,731
(d) Benefit Payments with interest to 6/30/2017	\$1,253,584
(e) Expected Assets at 6/30/2017 [(a) + (b) + (c) - (d)]	\$6,666,267
(f) Actual Assets at 7/1/2017	\$6,944,559
(g) Asset (Gain)/Loss [(e) - (f)]	(\$278,292)
3. Total (Gain)/Loss [1(h) + 2(g)]	(\$1,299,293)

Graphs 1A and 1B: Solvency Projections

Graph 1A



Graph 1B



SECTION II

ACTUARIAL PROJECTIONS

ALTERNATIVE FUNDING POLICY

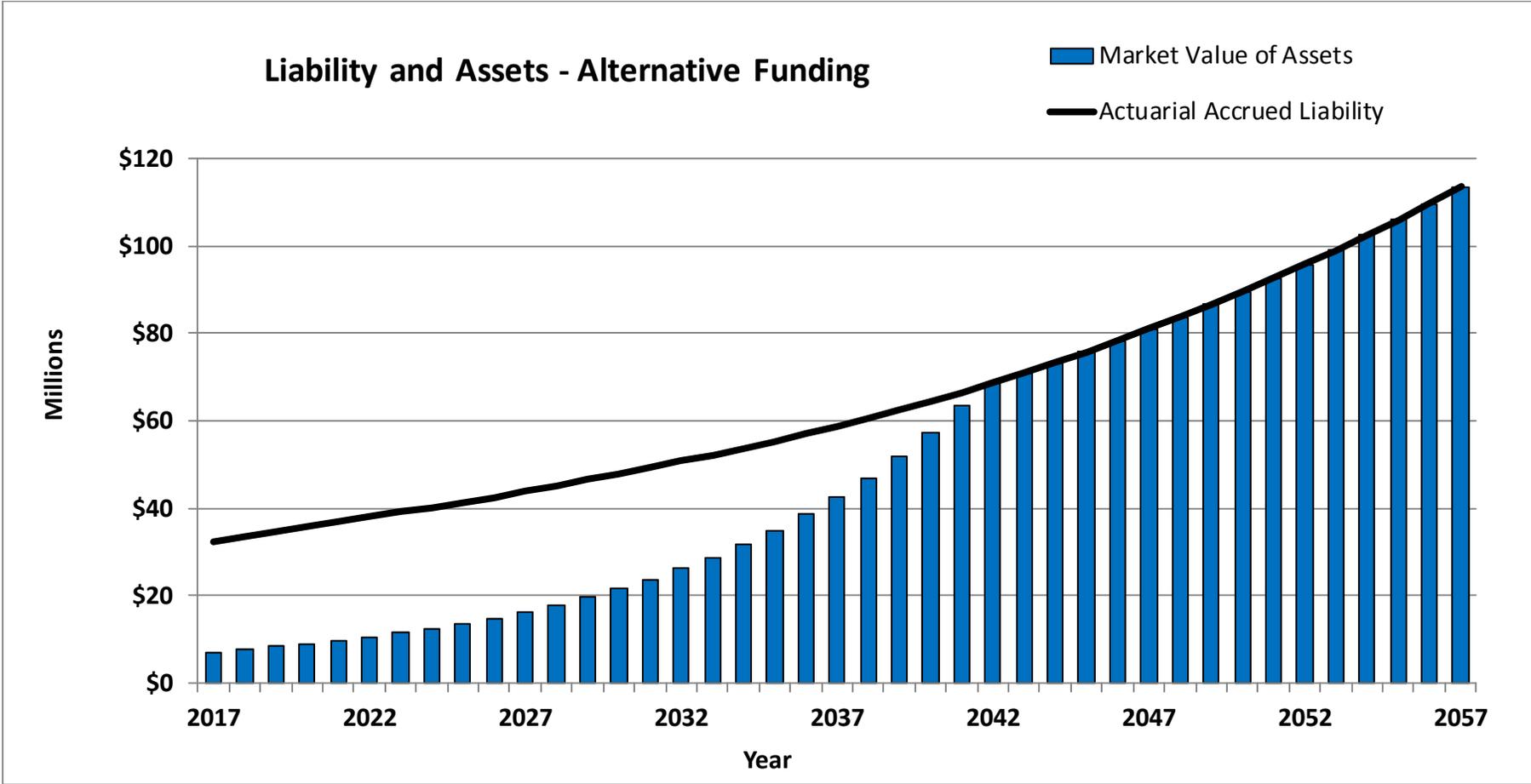
Alternative Funding on a Closed Group Basis, Table 1

Valuation Year End 30-Jun	Number		Total Assets											Actuarial Accrued Liability	Unfunded Liability	Funded Ratio
	Active	Status	Total Payroll	Assets (boy)	Benefit Payments	Expenses	Employer Contributions	Employee Contributions	Premium Tax Allocation Contributions	Investment Income	Assets (eoy)	Actuarial				
												Liability	Unfunded Liability			
2017	42	51	\$1,919,071	\$5,649,638	\$1,223,009	\$7,500	\$1,345,298	\$148,321	\$445,631	\$586,180	\$6,944,559	\$32,233,592	\$25,289,033	22%		
2018	37	54	1,912,017	6,944,559	1,262,180	7,706	1,015,700	143,534	442,818	355,431	7,632,156	33,486,270	25,854,114	23%		
2019	33	56	1,771,592	7,632,156	1,393,226	7,766	1,086,799	133,720	446,391	388,174	8,286,248	34,587,440	26,301,192	24%		
2020	30	59	1,661,805	8,286,248	1,499,503	7,837	1,162,875	126,071	407,639	418,985	8,894,479	35,574,158	26,679,679	25%		
2021	26	61	1,548,304	8,894,479	1,608,047	7,922	1,244,276	118,212	395,465	448,230	9,484,693	36,435,965	26,951,272	26%		
2022	24	62	1,462,381	9,484,693	1,691,165	8,010	1,331,375	112,335	383,617	477,399	10,090,244	37,206,525	27,116,281	27%		
2023	22	62	1,412,056	10,090,244	1,755,998	8,108	1,424,571	109,007	377,834	508,150	10,745,700	37,921,164	27,175,464	28%		
2024	19	63	1,351,936	10,745,700	1,835,107	8,210	1,524,291	105,024	374,371	541,245	11,447,313	38,559,856	27,112,543	30%		
2025	18	64	1,295,648	11,447,313	1,905,556	8,312	1,630,991	101,317	369,831	577,015	12,212,599	39,129,501	26,916,902	31%		
2026	17	64	1,269,082	12,212,599	1,951,098	8,413	1,745,160	99,706	367,895	616,884	13,082,733	39,666,441	26,583,708	33%		
2027	16	63	1,259,726	13,082,733	1,983,234	8,513	1,867,321	99,319	368,089	662,607	14,088,322	40,191,578	26,103,256	35%		
2028	14	64	1,237,676	14,088,322	2,021,882	8,612	1,998,033	98,072	369,506	715,161	15,238,600	40,691,409	25,452,809	37%		
2029	13	64	1,180,932	15,238,600	2,085,478	8,712	2,137,895	94,428	369,367	774,463	16,520,563	41,122,541	24,601,978	40%		
2030	12	64	1,112,229	16,520,563	2,148,998	8,809	2,287,548	89,451	367,910	840,527	17,948,191	41,475,252	23,527,061	43%		
2031	10	64	1,031,569	17,948,191	2,219,905	8,903	2,447,676	83,256	366,747	913,927	19,530,989	41,733,407	22,202,418	47%		
2032	8	65	910,997	19,530,989	2,317,979	8,993	2,619,013	74,097	365,659	994,622	21,257,408	41,846,168	20,588,760	51%		
2033	7	65	791,952	21,257,408	2,406,043	9,075	2,802,344	65,035	362,754	1,082,998	23,155,421	41,816,601	18,661,180	55%		
2034	6	64	703,393	23,155,421	2,471,797	9,150	2,998,508	58,505	362,669	1,180,953	25,275,110	41,677,336	16,402,226	61%		
2035	5	64	622,613	25,275,110	2,524,992	9,218	3,208,404	52,286	364,263	1,290,691	27,656,544	41,439,266	13,782,722	67%		
2036	3	64	498,925	27,656,544	2,610,242	9,280	3,432,992	42,190	365,783	1,412,990	30,290,978	41,046,378	10,755,400	74%		
2037	2	63	374,882	30,290,978	2,688,874	9,333	3,673,301	32,127	365,466	1,548,448	33,212,113	40,498,845	7,286,732	82%		
2038	2	62	307,861	33,212,113	2,717,859	9,377	3,930,432	26,764	367,908	1,700,065	36,510,046	39,864,589	3,354,543	92%		
2039	2	61	258,926	36,510,046	2,731,017	9,412	3,154,586	22,873	370,779	1,845,451	39,163,307	39,163,307	0	100%		
2040	1	60	226,657	39,163,307	2,729,383	9,436	76,577	20,344	0	1,892,923	38,414,332	38,414,332	0	100%		
2041	1	58	204,564	38,414,332	2,717,613	9,450	68,719	18,626	0	1,855,529	37,630,142	37,630,142	0	100%		
2042	1	57	187,450	37,630,142	2,699,507	9,454	62,478	17,304	0	1,816,579	36,817,542	36,817,542	0	100%		
2043	1	55	176,423	36,817,542	2,674,455	9,448	58,311	16,465	0	1,776,444	35,984,859	35,984,859	0	100%		
2044	1	54	146,285	35,984,859	2,665,079	9,433	49,261	13,728	0	1,734,751	35,108,086	35,108,086	0	100%		
2045	0	52	108,339	35,108,086	2,658,035	9,409	38,145	10,193	0	1,690,725	34,179,705	34,179,705	0	100%		
2046	0	51	88,330	34,179,705	2,631,237	9,377	32,104	8,351	0	1,644,774	33,224,320	33,224,320	0	100%		
2047	0	49	64,657	33,224,320	2,607,303	9,336	25,705	6,142	0	1,597,384	32,236,913	32,236,913	0	100%		
2048	0	48	43,265	32,236,913	2,579,564	9,287	20,322	4,110	0	1,548,517	31,221,011	31,221,011	0	100%		
2049	0	46	31,416	31,221,011	2,540,625	9,231	17,242	2,985	0	1,498,581	30,189,963	30,189,963	0	100%		
2050	0	45	22,518	30,189,963	2,497,693	9,166	14,899	2,139	0	1,448,012	29,148,154	29,148,154	0	100%		
2051	0	43	15,717	29,148,154	2,451,435	9,093	13,084	1,493	0	1,397,005	28,099,208	28,099,208	0	100%		
2052	0	42	10,947	28,099,208	2,402,081	9,011	11,777	1,040	0	1,345,735	27,046,668	27,046,668	0	100%		
2053	0	40	7,532	27,046,668	2,350,299	8,921	10,828	716	0	1,294,357	25,993,349	25,993,349	0	100%		
2054	0	39	4,177	25,993,349	2,297,115	8,822	9,852	397	0	1,242,975	24,940,636	24,940,636	0	100%		
2055	0	37	1,903	24,940,636	2,241,886	8,715	9,154	181	0	1,191,684	23,891,054	23,891,054	0	100%		
2056	0	35	1,277	23,891,054	2,184,349	8,598	8,891	121	0	1,140,620	22,847,740	22,847,740	0	100%		
2057	0	34	518	22,847,740	2,125,810	8,471	8,592	49	0	1,089,894	21,811,994	21,811,994	0	100%		

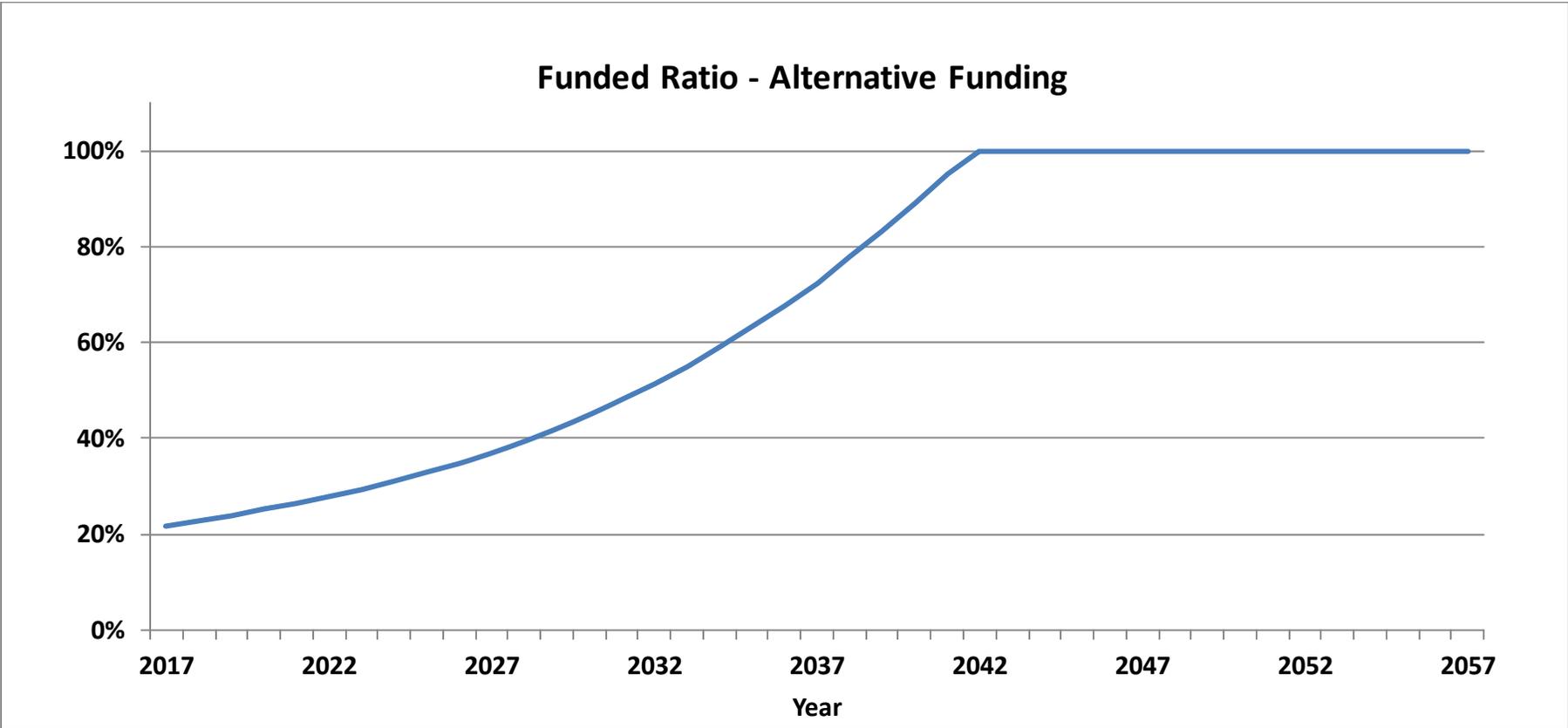
Alternative Funding on an Open Group Basis, Table 2

Valuation Plan Year End 30-Jun	Number		Total Assets										Actuarial Accrued Liability	Unfunded Liability	Funded Ratio	
	Active	Pay Status	Total Payroll	Assets			Benefit		Employer	Employee	Premium Tax	Investment				Assets
				(boy)	Payments	Expenses	Contributions	Contributions	Allocation	Income	(eoy)					
2017	42	51	\$1,919,071	\$5,649,638	\$1,223,009	\$7,500	\$1,345,298	\$148,321	\$445,631	\$586,180	\$6,944,559	\$32,233,592	\$25,289,033	22%		
2018	42	54	1,912,017	6,944,559	1,262,180	7,706	1,015,700	143,534	442,818	355,431	7,632,156	33,486,276	25,854,120	23%		
2019	42	56	1,928,145	7,632,156	1,393,226	8,196	1,086,799	149,778	446,391	388,561	8,302,263	34,659,962	26,357,699	24%		
2020	42	59	1,966,185	8,302,263	1,500,108	8,611	1,162,875	156,292	474,944	422,161	9,009,816	35,790,618	26,780,802	25%		
2021	42	61	2,009,155	9,009,816	1,610,182	9,044	1,244,276	163,418	491,795	457,412	9,747,490	36,874,827	27,127,337	26%		
2022	42	62	2,090,608	9,747,490	1,695,648	9,490	1,331,375	173,647	509,114	495,005	10,551,493	37,954,920	27,403,427	28%		
2023	42	63	2,178,175	10,551,493	1,763,428	9,849	1,424,571	183,379	523,818	536,428	11,446,413	39,056,554	27,610,141	29%		
2024	42	64	2,250,548	11,446,413	1,845,907	10,193	1,524,291	192,149	538,574	582,172	12,427,498	40,160,795	27,733,297	31%		
2025	42	64	2,346,188	12,427,498	1,920,128	10,579	1,630,991	203,307	554,750	632,693	13,518,533	41,287,291	27,768,758	33%		
2026	42	64	2,457,020	13,518,533	1,969,800	10,909	1,745,160	214,986	569,255	689,477	14,756,702	42,469,899	27,713,197	35%		
2027	42	64	2,576,139	14,756,702	2,006,481	11,208	1,867,321	227,029	583,114	754,128	16,170,605	43,729,425	27,558,820	37%		
2028	42	64	2,679,111	16,170,605	2,050,154	11,491	1,998,033	237,912	596,914	827,576	17,769,394	45,054,813	27,285,419	39%		
2029	42	64	2,771,351	17,769,394	2,119,201	11,830	2,137,895	248,909	612,884	909,921	19,547,973	46,417,948	26,869,975	42%		
2030	42	65	2,874,270	19,547,973	2,188,714	12,205	2,287,548	260,763	629,916	1,001,533	21,526,814	47,824,339	26,297,525	45%		
2031	42	65	2,968,953	21,526,814	2,266,361	12,568	2,447,676	271,656	646,870	1,103,191	23,717,278	49,265,199	25,547,921	48%		
2032	42	66	3,045,563	23,717,278	2,371,784	12,967	2,619,013	281,822	665,390	1,215,041	26,113,793	50,705,818	24,592,025	52%		
2033	42	66	3,155,015	26,113,793	2,467,872	13,413	2,802,344	295,190	686,492	1,337,861	28,754,394	52,170,330	23,415,936	55%		
2034	42	66	3,277,688	28,754,394	2,542,590	13,786	2,998,508	309,156	705,068	1,473,685	31,684,435	53,690,969	22,006,534	59%		
2035	42	65	3,408,239	31,684,435	2,605,544	14,142	3,208,404	323,602	724,312	1,624,638	34,945,706	55,286,493	20,340,787	63%		
2036	42	66	3,498,686	34,945,706	2,701,188	14,483	3,432,992	334,536	743,216	1,791,614	38,532,393	56,910,298	18,377,905	68%		
2037	42	65	3,639,474	38,532,393	2,790,908	14,918	3,673,301	349,100	765,730	1,975,573	42,490,270	58,594,382	16,104,112	73%		
2038	42	64	3,788,608	42,490,270	2,832,147	15,243	3,930,432	361,187	785,113	2,179,567	46,899,180	60,386,687	13,487,507	78%		
2039	42	64	3,936,012	46,899,180	2,864,582	15,594	4,205,562	373,507	805,590	2,406,807	51,810,471	62,282,712	10,472,241	83%		
2040	42	64	4,089,550	51,810,471	2,904,526	15,974	4,499,951	386,871	827,500	2,659,517	57,263,810	64,284,144	7,020,334	89%		
2041	42	64	4,244,696	57,263,810	2,953,698	16,369	4,814,948	400,425	850,140	2,939,633	63,298,889	66,389,982	3,091,093	95%		
2042	42	64	4,403,435	63,298,889	3,012,103	16,791	5,144,225	415,067	874,071	3,216,347	68,596,705	68,596,705	0	100%		
2043	42	63	4,572,460	68,596,705	3,079,041	17,230	5,576,394	430,465	0	3,402,932	70,910,224	70,910,224	0	100%		
2044	42	63	4,718,481	70,910,224	3,172,105	17,672	6,167,986	443,388	0	3,517,646	73,299,466	73,299,466	0	100%		
2045	42	63	4,880,784	73,299,466	3,278,935	18,183	6,663,831	458,850	0	3,635,971	75,761,001	75,761,001	0	100%		
2046	42	63	5,058,253	75,761,001	3,379,010	18,677	7,270,745	475,251	0	3,758,374	78,317,684	78,317,684	0	100%		
2047	42	63	5,231,556	78,317,684	3,488,906	19,174	7,774,352	491,095	0	3,885,198	80,960,248	80,960,248	0	100%		
2048	42	63	5,417,143	80,960,248	3,606,257	19,700	8,334,126	508,336	0	4,016,317	83,693,070	83,693,070	0	100%		
2049	42	63	5,611,206	83,693,070	3,723,207	20,225	8,900,201	526,072	0	4,152,126	86,528,038	86,528,038	0	100%		
2050	42	63	5,812,194	86,528,038	3,843,467	20,767	9,566,153	544,869	0	4,292,984	89,467,809	89,467,809	0	100%		
2051	42	63	6,023,048	89,467,809	3,970,125	21,326	10,339,546	564,477	0	4,439,128	92,519,508	92,519,508	0	100%		
2052	42	63	6,240,688	92,519,508	4,099,523	21,898	11,144,848	584,577	0	4,590,859	95,688,371	95,688,371	0	100%		
2053	42	63	6,467,463	95,688,371	4,232,436	22,493	12,009,574	606,174	0	4,748,384	98,977,575	98,977,575	0	100%		
2054	42	63	6,706,370	98,977,575	4,372,857	23,104	12,922,268	629,290	0	4,911,974	102,395,146	102,395,146	0	100%		
2055	42	63	6,958,992	102,395,146	4,516,259	23,726	13,862,615	653,304	0	5,082,121	105,953,200	105,953,200	0	100%		
2056	42	63	7,220,643	105,953,200	4,660,127	24,357	14,844,665	677,962	0	5,259,337	109,660,679	109,660,679	0	100%		
2057	42	63	7,493,464	109,660,679	4,807,243	25,009	15,874,503	704,131	0	5,443,975	113,523,036	113,523,036	0	100%		

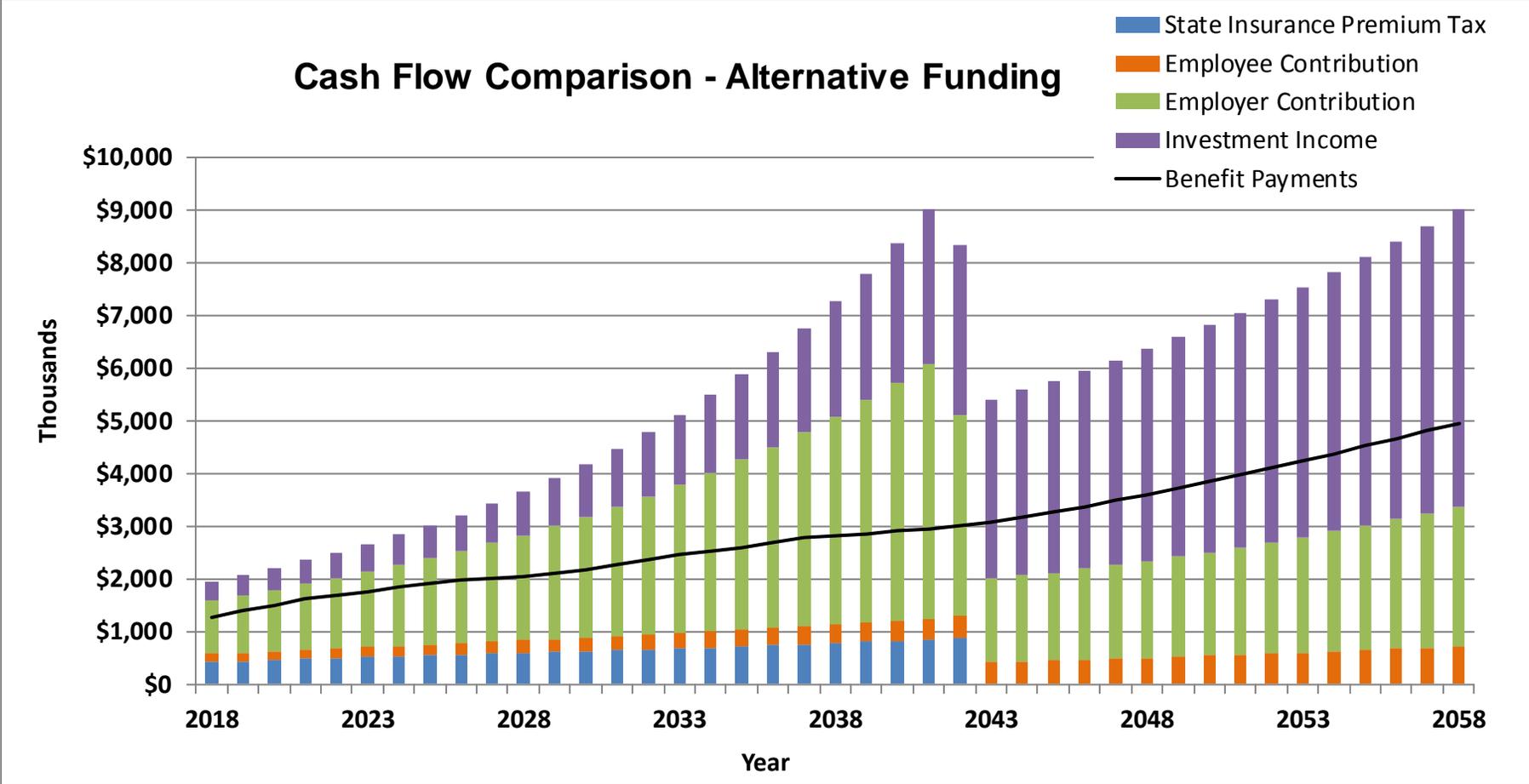
Open Group Actuarial Projections – Alternative Funding, Graph 2



Open Group Actuarial Projections – Alternative Funding, Graph 3



Open Group Actuarial Projections – Alternative Funding, Graph 4



SECTION III

FUNDING POLICY CHOICES

Actuarial Projections –Alternative/Optional/Conservation Funding

Funding Policy Choices

West Virginia Code §8-22-20 allows a municipality's governing body (City Council) the choice of changing from the Alternative funding policy to either the Optional funding policy or the Conservation funding policy. The Optional funding policy is defined in West Virginia Code §8-22-20(e)(1), and is effective for plan years beginning after January 1, 2010. The Conservation funding policy is defined in West Virginia Code §8-22-20(f)(1), and is effective for plan years beginning after April 1, 2011.

If the City Council elects either the Optional funding policy or the Conservation funding policy, the existing local Plan is closed, and new employees are covered in the multiple employer statewide plan - *Municipal Police Officers and Firefighters Retirement System*. Contributions to the statewide plan include:

- Employer contributions from 8.5% to 10.5% of pay. Currently, Employers contribute 8.5% of pay.
- Employee contributions of 8.5% of pay.

If the City Council elects the Optional funding policy, contributions to the closed local Plan include:

- Employer contributions equal to the normal cost, net of employee contributions, plus a 40-year closed period amortization from January 1, 2010, on a level dollar basis, of the unfunded actuarial accrued liability net of premium tax allocation applicable to the plan year.
- Employee contributions of 7% of pay if hired before January 1, 2010, which may be increased by up to 2.5% of pay if elected by the Board of trustees of the Plan. Employees hired after January 1, 2010, contribute 9.50% of pay.
- The premium tax allocation assigned to the Fund for the plan year.

If the City Council elects the Conservation funding policy, contributions to the closed local Plan are made to two asset accounts as follows:

- The first asset account (Benefit Payment Account) is used to finance benefits and expenses for the fiscal year on a pay-as-you-go basis. Sources to pay current year benefits and expenses include active member employee contributions in excess of 1.50% of pay, a portion of the premium tax allocation not assigned to the accumulation account as defined below, and employer contributions.
- The second account (Accumulation Account) cannot be used to pay benefits and expenses until assets exceed actuarial accrued liabilities. Contributions to the accumulation account include employee contributions of 1.50% of pay and a percentage of the premium tax allocation. The percentage of premium tax allocation is based on the amounts needed to produce 100% funding of liabilities in 35 years, from adoption, considering assets from both the benefit payment account and the accumulation account. This account also includes the Fund's assets prior to the adoption of Conservation funding policy.

Actuarial Projections –Alternative/Optional/Conservation Funding (Continued)

For purposes of evaluating the implication of selecting either the Optional funding policy or the Conservation funding policy, we have generated actuarial projections under the following two illustrative scenarios.

- Scenario I – The sponsor elects either the Optional funding policy or Conservation funding policy during fiscal year end June 30, 2019, and makes the newly elected contribution in fiscal year end June 30, 2019.
- Scenario II – The sponsor elects either the Optional funding policy or the Conservation funding policy at some future date when/if contributions are projected to be less than under the current Alternative funding policy.

It is important to note that the plan sponsor can make only one election to either the Optional funding policy or the Conservation funding policy, and that the election is irrevocable. The projections assume employer contributions of 10.5% of pay for future members covered under the statewide plan.

Given that the funded ratio as of June 30, 2017 is only 22% and that the ratio of assets to expected benefits for the year is only 5.50, we strongly recommend that the sponsor make additional contributions in excess of the statutory minimum under both the Alternative and Conservation funding policies.

Scenario I – Sponsor Immediately Elects either the Optional or Conservation Funding Policy

The following table shows the employer contribution for the fiscal year end June 30, 2019, if the sponsor elects either the Optional or Conservation funding policy in fiscal year end June 30, 2019:

Total Employer Contributions for FYE June 30, 2019				
	Local Plan		Statewide Plan	
Funding Method	Amount	Percent of Pay	Amount	Percent of Pay
Alternative	\$1,086,799	56.4%	NA	NA
Optional	\$1,881,418	106.2%	\$16,438	10.5%
Conservation	\$847,455	47.8%	\$16,438	10.5%

Graphs I(1), I(2), and I(3) on the following pages show the projected contribution and funded ratio pattern of the three separate funding policies. If the sponsor continues to make contributions under the Alternative policy, employer contributions are projected to increase from \$1,015,700 in fiscal year end 2018 to \$4,814,948 in fiscal year end 2041. In fiscal year end 2042, the plan is projected to be 100% funded.

If the Optional funding policy is selected in fiscal year end 2019, employer contributions to the local plan for fiscal year end 2019 are projected to increase from \$1,086,799 to \$1,881,418. However, over the 40-year projection period, total employer contributions to both the local plan and the statewide plan are projected to decrease from \$1,897,856 in fiscal year end 2019 to \$1,073,947 in fiscal year end 2049, and the Plan is projected to be fully funded in 2050.

Actuarial Projections –Alternative/Optional/Conservation Funding (Continued)

If the Conservation funding policy is selected in fiscal year end 2019, employer contributions to the local plan for fiscal year end 2019 are projected to decrease from \$1,086,799 to \$847,455. During the 35-year projection period, total employer contributions to both the local plan and the statewide plan are projected to increase from \$863,893 in fiscal year end 2019 to \$2,177,558 in fiscal year end 2046 and the Plan is projected to be fully funded in 2047.

The Optional funding policy is consistent with actuarial standards of practice and produces a relatively stable dollar contribution pattern and reasonable growth in the funded ratio.

The Conservation funding policy produces a less stable contribution pattern and slower growth in the funded ratio when compared to the Optional funding policy. The projections of employer contributions under the Conservation funding policy are dependent on the expected number of retirements, disabilities, and resulting benefit payments. Actual experience could produce a significantly higher number of retirements, disabilities, and benefit payments, which would increase the employer's required contribution under the Conservation funding policy. Unlike the Optional funding policy, the Conservation funding policy does not have a built-in feature to smooth out emerging gains and losses.

The Alternative funding policy produces a lower funded ratio over the next 19 years when compared to the Optional funding policy. The Alternative funding policy produces a higher funded ratio when compared to the Conservation funding policy. However, the 7% annual increases in employer contributions may eventually be cost prohibitive.

The details of the Optional and Conservation funding policy projections can be found in the Appendix. The details of the Alternative funding policy projection were presented in Section II.

Scenario II – Sponsor Elects Optional or Conservation Policy if/when Contributions are Lower

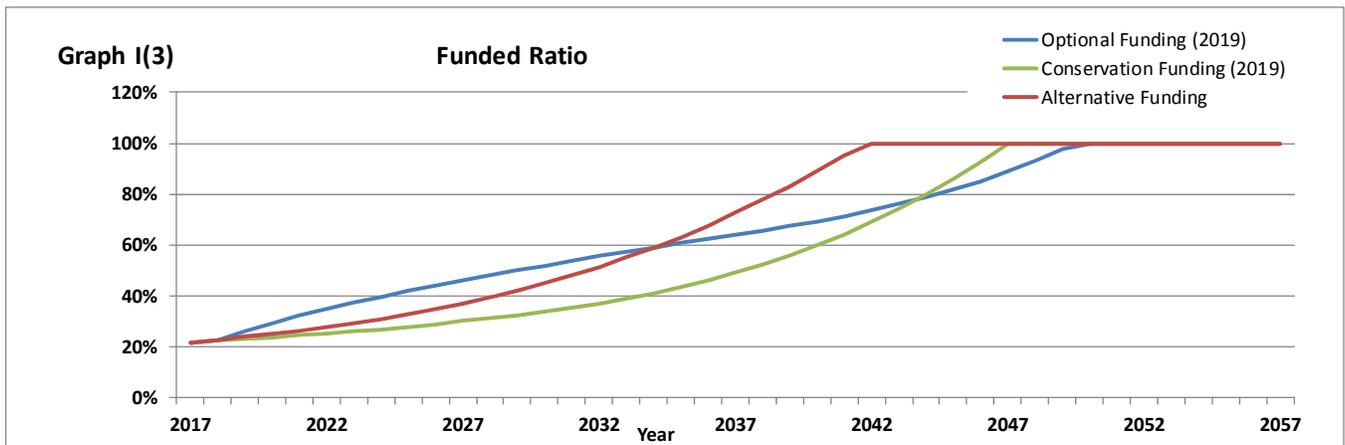
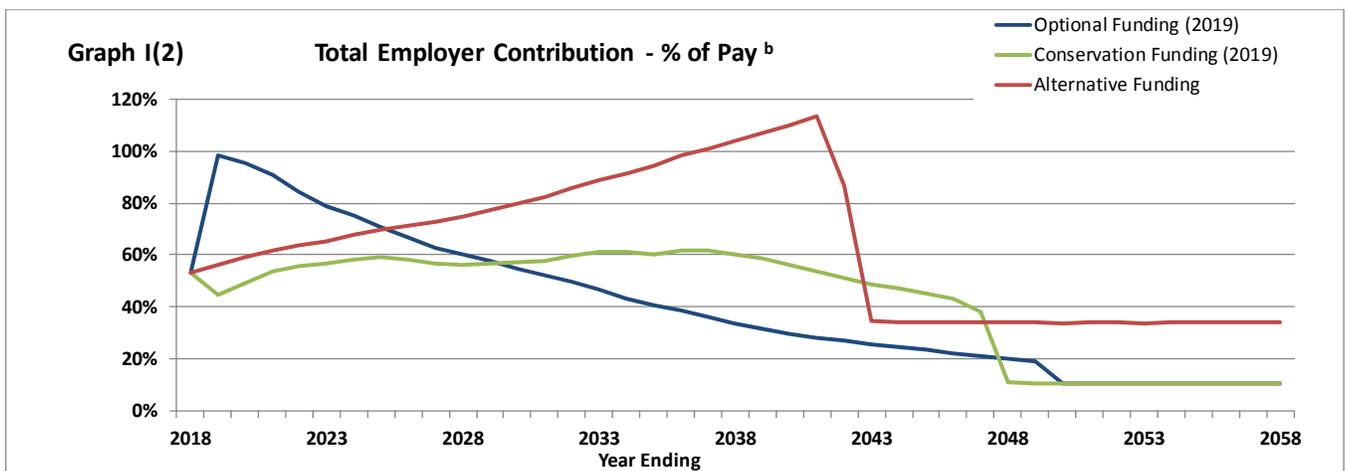
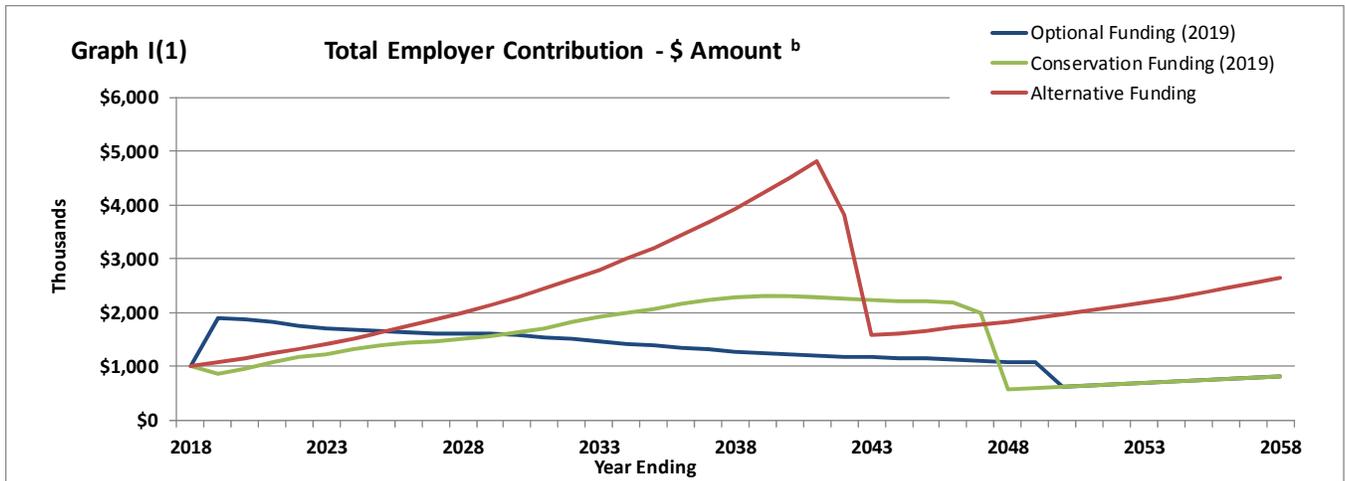
Under Scenario II, the plan sponsor is assumed to make contributions under the Alternative funding policy in future years, until the first year that either the Optional or Conservation policy produces a lower contribution. Under this assumption, in plan year end 2032, the employer contributions under the Optional funding policy of \$2,512,375 are projected to be lower than contributions under the Alternative funding policy of \$2,619,013. Similarly, in plan year end 2019, the employer contributions under the Conservation funding policy of \$847,455 are projected to be lower than contributions under the Alternative funding policy of \$1,086,799.

Graphs II(1), II(2), and III(3) show the projected contribution pattern and funded ratio. Based on these projections, electing the Optional funding policy in 2032 appears to produce a relatively stable and actuarially sound contribution pattern as compared to either the Alternative funding policy or the Conservation funding policy. The Conservation funding policy has lower projected employer contributions than the Alternative funding policy beginning in 2019. After 2019, the funded ratio under the Conservation funding policy increases at a lower rate than the Alternative funding policy. As stated above, however, the Conservation funding policy is dependent on expected benefits payments when considering the expected number of retirement and disabilities. The ultimate employer contributions depend on the actual number of retirement and disabilities, which could result in a more volatile contribution pattern when compared to the Optional funding policy.

The details of the Scenario II projections can be found in the Appendix.

Actuarial Projections –Alternative/Optional/Conservation Funding^a (Continued)

Scenario I

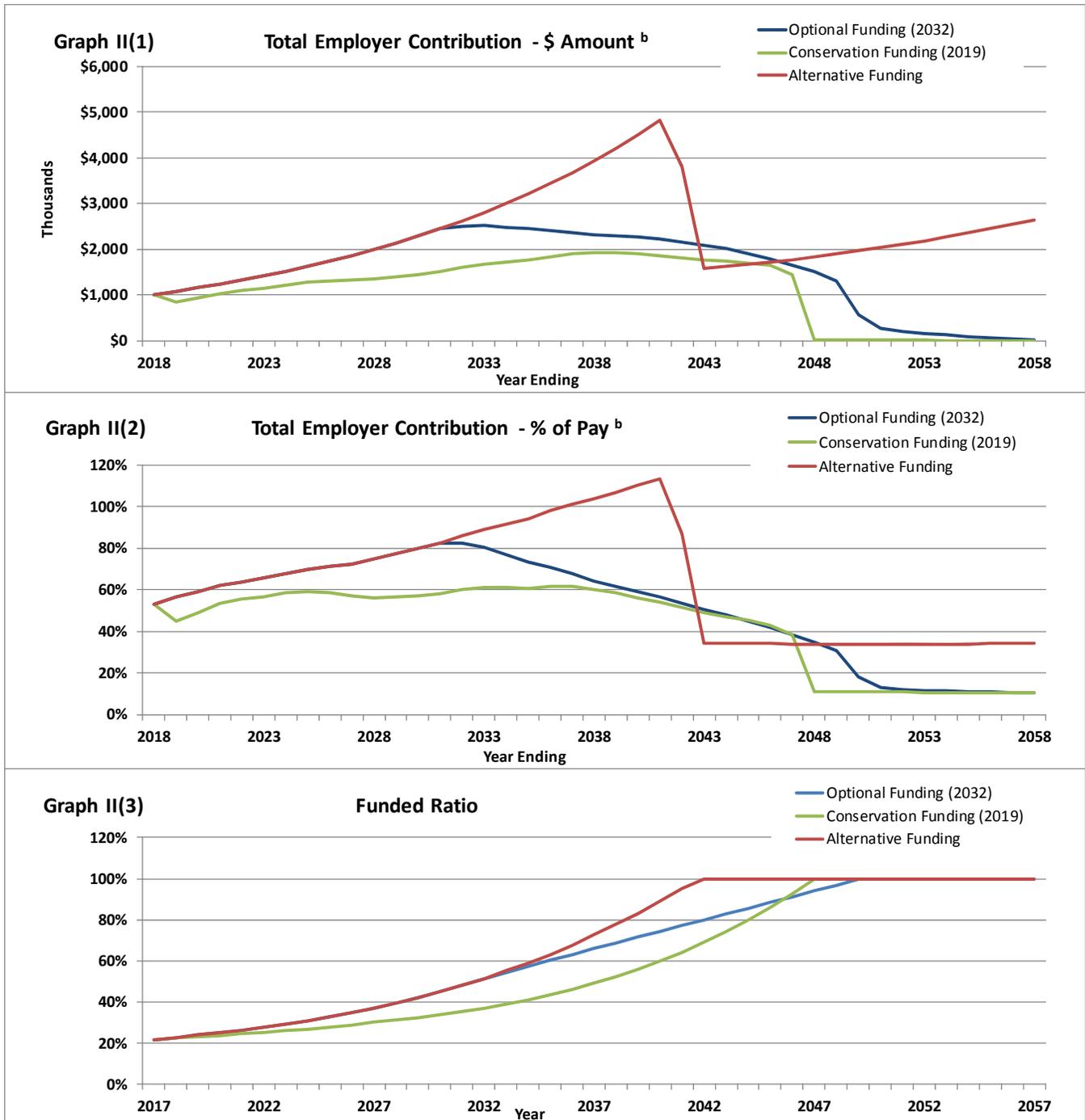


^a Assumes Sponsor elects either the Optional funding policy or Conservation funding policy in fiscal year end June 30, 2019, and makes the newly elected contribution in fiscal year end June 30, 2019.

^b Based on total pay and includes contributions for future members projected to participate in the statewide plan.

Actuarial Projections –Alternative/Optional/Conservation Funding^a (Continued)

Scenario II



^a Assumes Sponsor elects either the Optional funding policy or Conservation funding policy in the first year that contributions are lower than under the Alternative funding policy.

^b Based on total pay and includes contributions for future members projected to participate in the statewide plan.

SECTION IV

ACTUARIALLY DETERMINED CONTRIBUTION FOR GASB STATEMENT NOS. 67 AND 68 REPORTING

Actuarially Determined Contribution for GASB Statement Nos. 67 and 68 Reporting

Schedule C: Funding Progress and Employer Contributions

Valuation Date	July 1, 2016	July 1, 2017
Valuation Interest Rate	5.00%	5.00%
Cost-of-Living Adjustment	2.75%	2.75%
Wage Inflation	3.75%	3.75%
Actuarial Value of Assets	Market	Market
Actuarial Cost Method	Entry Age Normal	Entry Age Normal
Remaining Amortization Period ^a	24 Years, Level % of Pay	23 Years, Level % of Pay
Schedule of Funding Progress		
Actuarial Valuation Date	July 1, 2016	July 1, 2017
1. Market Value of Assets	\$5,649,638	\$6,944,559
2. Actuarial Accrued Liability	\$31,973,305	\$32,233,592
3. Unfunded Actuarial Accrued Liability (2 - 1)	\$26,323,667	\$25,289,033
4. Funded Ratio (1/2)	18%	22%
5. Expected Payroll	\$1,919,071	\$1,912,017
6. UAAL as Percentage of Covered Payroll (3/5)	1,372%	1,323%
Schedule of Employer Contributions ^c		
	FYE 2017	FYE 2018
1. Actuarially Determined Contribution		
(a) Employer Normal Cost	\$776,547	\$776,009
(b) Amortization of Unfunded Actuarial Accrued Liability	\$1,254,462	\$1,250,397
(c) Actuarially Determined Contribution (ADC) (a + b)	\$2,031,009	\$2,026,406
2. Employer Contribution ^b	\$1,345,298	\$1,015,700
3. Premium Tax Allocation	\$445,631	\$442,818
4. Percentage of ADC Contributed [(2 + 3)/1(c)]	88%	72%

^a Suggested amortization policy to comply with GASB Statement Nos. 67 and 68 Standards.

^b Estimated employer contribution for fiscal year end June 30, 2018.

^c The Alternative minimum contribution plus the premium tax allocation does not satisfy the Actuarially Determined Contribution as defined by GASB Statement Nos. 67 and 68.

SECTION V

ACTUARIAL VALUATION DATA AS OF JULY 1, 2017

Actuarial Valuation Data as of July 1, 2017

Schedule D: Reconciliation of Assets

Plan Year Ending	June 30, 2016	June 30, 2017
A. Market Value of Assets Beginning of Year	\$5,072,427	\$5,649,638
Adjustment to Market Value of Assets at Beginning of Year	\$0	\$0
Market Value of Assets Beginning of Year	\$5,072,427	\$5,649,638
1. Revenue During Fiscal Year		
(a) Employee Contribution	\$145,720	\$148,321
(b) Governmental Contribution		
(i) From Local Government	\$936,850	\$1,345,298
(ii) From State Government	\$424,421	\$445,631
(iii) Reallocation from State Government	\$0	\$0
(iv) Total	\$1,361,271	\$1,790,929
(c) Earnings on Investments		
(i) Net Appreciation/(Depreciation)	\$231,197	\$497,840
(ii) Bond Interest	\$34,048	\$35,515
(iii) Dividends	\$60,490	\$67,353
(iv) Net Realized Gain (Loss) on Sale/Exchange	\$8,048	\$6,367
(v) Other	\$24	\$512
(vi) Less Investment Expense	(\$18,295)	(\$21,407)
(vii) Total	\$315,512	\$586,180
(d) Other Revenue	\$0	\$0
(e) Net Receivable Investment Income	\$0	\$0
(f) Receivable Contribution ^a		
(i) From Employee Contributions	\$0	\$0
(ii) From Local Government	\$0	\$0
(iii) From State Government	\$0	\$0
(iv) Total	\$0	\$0
(g) Total Revenue (sum of (a) through (f))	\$1,822,503	\$2,525,430
2. Expenditures During Fiscal Year		
(a) Benefits Paid	\$1,239,292	\$1,178,192
(b) Withdrawals	\$0	\$44,817
(c) Administrative Expenses	\$6,000	\$7,500
(d) Payable Benefits and Withdrawals	\$0	\$0
(e) Payable Administrative Expenses	\$0	\$0
(f) Total Expenditures (sum of (a) through (e))	\$1,245,292	\$1,230,509
B. Market Value of Assets End of Year		
[A + 1(g) - 2(f)]	\$5,649,638	\$6,944,559
C. Approximate Return on Assets	5.95%	9.64%

^a Receivable contributions for each respective plan year ending.

Actuarial Valuation Data as of July 1, 2017

Schedule E: Assets Held by Category

Plan Year Ending	June 30, 2016		June 30, 2017	
1. Cash and Short-term Investments	\$731,614	13%	\$471,318	7%
2. Government Securities				
(a) US Treasury Bills, Notes and Bonds	\$537,903		\$1,065,754	
(b) US State and Local Governmental Debt Securities	\$0		\$0	
(c) Foreign Governmental Debt Securities	\$0		\$0	
(d) Other	\$0		\$0	
(e) Total Government Securities (sum of (a) through (d))	\$537,903	10%	\$1,065,754	15%
3. Corporate Fixed Income				
(a) US Bonds	\$886,710		\$1,510,978	
(b) US Mortgage or other Asset Backed Securities	\$0		\$0	
(c) US Mutual Fund Shares (Bonds)	\$0		\$0	
(d) US Exchange Traded Funds (Bonds)	\$0		\$0	
(e) International Bonds	\$0		\$0	
(f) International Mutual Fund Shares (Bonds)	\$0		\$0	
(g) International Exchange Traded Funds (Bonds)	\$0		\$0	
(h) Total Corporate Fixed Income (sum of (a) through (g))	\$886,710	15%	\$1,510,978	22%
4. Corporate Equity				
(a) US Equity	\$1,017,322		\$1,165,087	
(b) US Mutual Fund Shares (Equity)	\$0		\$0	
(c) US Exchange Traded Funds (Equity)	\$2,315,272		\$2,519,369	
(d) International Equity	\$0		\$0	
(e) International Mutual Fund Shares (Equity)	\$0		\$0	
(f) International Exchange Traded Funds (Equity)	\$160,817		\$212,053	
(g) Total Corporate Equity (sum of (a) through (f))	\$3,493,411	62%	\$3,896,509	56%
5. Alternative Investments				
(a) Real Estate Investment Trust	\$0		\$0	
(b) Private Equity Fund	\$0		\$0	
(c) Hedge Funds	\$0		\$0	
(d) Other Alternative Investments	\$0		\$0	
(e) Total Alternative Investments (sum of (a) through (d))	\$0	0%	\$0	0%
6. Other	\$0	0%	\$0	0%
7. Receivable Contributions	\$0			
(a) From Employee Contributions	\$0		\$0	
(b) From Local Government	\$0		\$0	
(c) From State Government	\$0		\$0	
(d) Total Receivable Contributions (sum of (a) through (c))	\$0	0%	\$0	0%
8. Accruals				
(a) Receivable (other than State and Local Contributions)	\$0		\$0	
(b) Less Payable	\$0		\$0	
(c) Total	\$0	0%	\$0	0%
Market Value of Assets End of Year	\$5,649,638		\$6,944,559	
[sum of (1) through (8)]				

Actuarial Valuation Data as of July 1, 2017

Schedule F: Summary of Participant Activity

	Actives	Retirees	Disabled	Deferred Vested	Spouses and Beneficiaries	Totals
Total Participants July 1, 2016:	42	29	6	0	18	95
New Actives:	2					2
Returned to Actives Status:						0
Data Corrections/Other Changes:						0
Vested Terminations:						0
Non-Vested Terminations:	(2)					(2)
Disabled:						0
Retirements:						0
Deaths with Beneficiary:						0
Deaths w/o Beneficiary:			(1)		(1)	(2)
Expired Annuity or Stop Payment:						0
Net Changes:	0	0	(1)	0	(1)	(2)
Total Participants June 30, 2017:	42	29	5	0	17	93

Actuarial Valuation Data as of July 1, 2017

Schedule G: Distribution of Active Employees by Age and Length of Service

Attained Age	Years of Service to Valuation Date									Totals	Valuation Payroll ^a
	Less than 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	Over 35		
Under 20											\$ 0
20-24	2	1								3	\$ 121,813
25-29											\$ 0
30-34		2	1	4						7	\$ 316,707
35-39			5	1	3					9	\$ 411,915
40-44			1	1	1	2				5	\$ 230,606
45-49			1		4	3				8	\$ 383,932
50-54					2	1	1			4	\$ 187,866
55-59					1	2	1	2		6	\$ 343,047
60-64											\$ 0
65-69											\$ 0
Over 70											\$ 0
Totals	2	3	8	6	11	8	2	2	0	42	\$ 1,995,885
Averages _____											
Age: 42.4 years											
Service: 14.9 years											
Annual Pay: \$47,521 ^a											

^a Based on payroll at beginning of plan year.

Actuarial Valuation Data as of July 1, 2017

Schedule H: Participants Summary

Active Participants	July 1, 2016	July 1, 2017
Number of Actives	42	42
Total Annual Pay	\$1,962,719	\$1,995,885
Average Age	41.9	42.4
Average Service	14.2	14.9

Inactive Participants	July 1, 2016		July 1, 2017	
Type	No.	Annual Benefit	No.	Annual Benefit
Retirees	29	\$852,269	29	\$859,325
Survivors	18	\$217,883	17	\$206,028
Disabled Members	6	\$119,700	5	\$108,173
Deferred Vested Members	0	\$0	0	\$0

SECTION VI

ACTUARIAL ASSUMPTIONS AND METHODS

Actuarial Assumptions and Methods Used in the Valuation as of July 1, 2017

Discount Rate

The following table outlines the factors used to determine the discount rate:

Funded Ratio as of Valuation Date ¹	Liquidity Ratio ²	Equity Exposure ³	Projected Funded Ratio after 15 Years ¹	Discount Rate
60% or more	10	50% or more	70% or more	6.5%
40% or more	8	40% or more	60% or more	6.0%
30% or more	6	30% or more	50% or more	5.5%
15% or more	4	n/a	40% or more	5.0%
Less than 15%	n/a	n/a	15% or more	4.5%
Less than 15%	n/a	n/a	Less than 15%	4.0%

¹Funded ratios based on a 6.0% investment return assumption for plans using an actuarially sound policy (standard or optional) and a 5.5% investment return assumption for other plans (alternative or conservation).

²Liquidity ratio equals assets as of the actuarial valuation date divided by expected benefit payments for the year.

³Based on investment policy.

As of June 30, 2017	
Assets	\$6,944,559
Liabilities using a 5.50% discount rate	\$30,127,133
Funded Ratio	23%
Expected Benefit Payments	\$1,262,180
Liquidity Ratio	5.50
Equity Exposure	56%
Projected Funded Ratio after 15 years	58%

Discount Rate

5.00%

Actuarial Assumptions and Methods Used in the Valuation as of July 1, 2017 (Continued)

The premium tax allocation is projected using the following methodology:

- (1) The Base Allocation for all Pension and Relief Funds is a fixed amount equal to \$8,709,689 in all future years. This amount is allocated to each individual Pension and Relief Fund in proportion to the number of eligible members, which includes active members covered in either the Pension and Relief Fund or the statewide plan, Municipal Police Officers and Firefighters Retirement System (“MPFRS”).
- (2) The Excess Allocation is equal to the excess of the current year premium tax assigned to all Pension and Relief Funds over the total Base Allocation. This amount is allocated to each individual Pension and Relief Fund in proportion to the number of eligible active and retired members covered in either the Pension and Relief Fund or the MPFRS.
- (3) We have assumed all Pension and Relief Funds will make the minimum statutory contribution requirement and will receive 100% of both the Base Allocation and the Excess Allocation assigned to the individual plan. Consequently, the projections do not include any reallocation of Expired Premium Tax Allocation for plan years beginning on and after July 1, 2019.
- (4) The total available premium tax allocation, net of expenses, as of September 1, 2018, includes a Base Allocation of \$8,709,689, an Excess Allocation of \$9,570,473, and an Expired Premium Tax Allocation of \$237,031.
- (5) For the plan year ending June 30, 2018, all Pension and Relief Funds reported a total of 1,717 eligible active members and 2,165 eligible retired members. The City of Clarksburg Firemen’s Pension and Relief Fund reported 42 eligible active members and 52 eligible retired members, based on the average number of plan participants for the 12-month period ending June 30, 2018. The Fund is eligible to receive a premium tax allocation of \$446,391 for the fiscal year ending June 30, 2019.
- (6) The total premium tax allocation was assumed to increase by 2.75% in calendar years ending on and after 2019.

Actuarial Assumptions and Methods Used in the Valuation as of July 1, 2017 (Continued)

General Inflation	2.75%																		
Expected Salary Increase	General Inflation: 2.75% <i>plus</i>																		
Service-based Increase:	Wage Inflation Increment: 1.00% <i>plus</i>																		
	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;"><u>Years of Service</u></th> <th style="text-align: center;"><u>Increase</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">20.00%</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">6.50%</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">3.50%</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">2.75%</td> </tr> <tr> <td style="text-align: center;">5-9</td> <td style="text-align: center;">2.50%</td> </tr> <tr> <td style="text-align: center;">10-29</td> <td style="text-align: center;">2.00%</td> </tr> <tr> <td style="text-align: center;">30-34</td> <td style="text-align: center;">1.25%</td> </tr> <tr> <td style="text-align: center;">after 34 years of service</td> <td style="text-align: center;">0.00%</td> </tr> </tbody> </table>	<u>Years of Service</u>	<u>Increase</u>	1	20.00%	2	6.50%	3	3.50%	4	2.75%	5-9	2.50%	10-29	2.00%	30-34	1.25%	after 34 years of service	0.00%
<u>Years of Service</u>	<u>Increase</u>																		
1	20.00%																		
2	6.50%																		
3	3.50%																		
4	2.75%																		
5-9	2.50%																		
10-29	2.00%																		
30-34	1.25%																		
after 34 years of service	0.00%																		
Post-retirement COLA	2.75% on first \$15,000 of Annual Benefit and on the accumulated supplemental pension amounts for prior years. Assumed to be payable to all members receiving payments.																		
Increase in State Insurance Premium Tax Allocation	2.75% on and after year 1																		
Cost Method	Entry-Age-Normal, Level-Percentage-of-Pay																		
<i>Amortization Policies:</i>																			
Alternative Plans and former Alternative Plans that selected the Conservation Policy	For GASB 67/68 Accounting: 30 – Year Closed Level-Percentage-of-Pay Amortization (from July 1, 2010 – 23 years remaining as of July 1, 2017).																		
Standard Plans and former Standard Plans that selected the Optional Policy	For funding and GASB 67/68 Accounting: 40-Year Closed Level-Dollar Amortization (from July 1, 1991 – 14 years remaining as of July 1, 2017)																		
Former Alternative Plans that selected the Optional Policy	For funding: 40-Year Closed Level-Dollar Amortization (from January 1, 2010 – 32.5 years remaining as of July 1, 2017). For GASB 67/68 Accounting: 30-Year Closed Level-Percentage-of-Pay Amortization (from July 1, 2010 – 23 years remaining as of July 1, 2017)																		

Actuarial Assumptions and Methods Used in the Valuation as of July 1, 2017 (Continued)

Asset Method	Market Value										
Turnover	<p>Sample Rates –</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;"><u>Age</u></th> <th style="text-align: center;"><u>Rates</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">25</td> <td style="text-align: center;">9%</td> </tr> <tr> <td style="text-align: center;">35</td> <td style="text-align: center;">4%</td> </tr> <tr> <td style="text-align: center;">45</td> <td style="text-align: center;">2%</td> </tr> <tr> <td style="text-align: center;">50</td> <td style="text-align: center;">0%</td> </tr> </tbody> </table>	<u>Age</u>	<u>Rates</u>	25	9%	35	4%	45	2%	50	0%
<u>Age</u>	<u>Rates</u>										
25	9%										
35	4%										
45	2%										
50	0%										
Retirement	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;"><u>Age</u></th> <th style="text-align: center;"><u>Rates^a</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">50</td> <td style="text-align: center;">45%</td> </tr> <tr> <td style="text-align: center;">51-55</td> <td style="text-align: center;">30%</td> </tr> <tr> <td style="text-align: center;">56-59</td> <td style="text-align: center;">35%</td> </tr> <tr> <td style="text-align: center;">60</td> <td style="text-align: center;">100%</td> </tr> </tbody> </table> <p>^aTerminated vested participants are assumed to retire at age 50.</p>	<u>Age</u>	<u>Rates^a</u>	50	45%	51-55	30%	56-59	35%	60	100%
<u>Age</u>	<u>Rates^a</u>										
50	45%										
51-55	30%										
56-59	35%										
60	100%										
Mortality	<p>Active: RP-2014 Blue Collar Healthy Employee^b</p> <p>Post-Retirement: RP-2014 Blue Collar Healthy Annuitant</p> <p>Disabled: RP-2014 Blue Collar Healthy Annuitant set forward four years</p> <p>Tables above incorporate generational mortality improvement using MP-2014 2-dimensional mortality improvement scales</p> <p>^bAssumes 10% of deaths are duty-related and 90% are non-duty related.</p>										
Disability	<p>Sample Rates –</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;"><u>Age</u></th> <th style="text-align: center;"><u>Rates^c</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">30</td> <td style="text-align: center;">0.22%</td> </tr> <tr> <td style="text-align: center;">40</td> <td style="text-align: center;">0.50%</td> </tr> <tr> <td style="text-align: center;">50</td> <td style="text-align: center;">0.79%</td> </tr> </tbody> </table> <p>^cAssumes 60% duty related and 40% non-duty related. Also assumes 10% of non-duty disabled members receive a 20% reduction in benefits due to gainful employment.</p>	<u>Age</u>	<u>Rates^c</u>	30	0.22%	40	0.50%	50	0.79%		
<u>Age</u>	<u>Rates^c</u>										
30	0.22%										
40	0.50%										
50	0.79%										
Percent Married	90%										
Spouse Age	Females 3 years younger than males										

Actuarial Assumptions and Methods Used in the Valuation as of July 1, 2017 (Continued)

Administrative Expenses	Plan year end June 30, 2018, expense based on plan year end June 30, 2017 expense increased by general inflation assumption. Future expenses assumed to increase by the general inflation assumption.
Refunds Paid	Assumes non-vested inactive members as of July 1, 2017, with accumulated member contribution balances will receive a refund of their contributions during plan year end June 30, 2018.
Data Adjustments and Assumptions	Annualized pay for one new active member based on Compensation for plan year end June 30, 2017 and Date of Hire.
Child Beneficiaries	Future survivor widow benefits are loaded by 12% to estimate impact of benefits provided to survivor children. The load assumes 90% of members are married with two children at time of death, and benefits for each child are paid for approximately 8 years.
General Projection Methodology	<p>Open group projections assume:</p> <ul style="list-style-type: none"> (i) Salaries will increase and members will decrement as specified in the actuarial assumption section. (ii) Active members who retire, become disabled, die or terminate during the year are replaced with new entrants such that the number of active members remains stable during the projection period. Pay for new entrants in future years is increased by the wage inflation assumption. The average age of a new entrant is based on observed experience over the last five years. (iii) Assets grow at the assumed rate of return. (iv) The sponsor makes the statutory required contribution on a monthly basis. (v) Non-vested members with accumulated plan balances as of July 1, 2017, will receive a refund during plan year end June 30, 2018. <p>Closed group projections are the same as the open group projections except active members who retire, become disabled, die, or terminate are <u>not</u> replaced with new entrants.</p>
Decrement Timing	Mid-Year

SECTION VII

SUMMARY OF PRINCIPAL PLAN PROVISIONS

Summary of Principal Plan Provisions

Actuarial Valuation as of July 1, 2017

Employee Eligibility — All compensated employees of the Fire Department are eligible to participate in the Firemen's Pension and Relief Fund.

Average Annual Compensation — The average of any three twelve-consecutive-month periods of employment which produces the highest average annual compensation.

Each twelve-consecutive-month annual compensation is limited to 120% of the *Average Adjusted Salary* received by the member in the two consecutive twelve-consecutive-month periods immediately preceding the twelve-consecutive-month period used in determining benefits.

The *Average Adjusted Salary* is base salary (exclusive of all overtime and other pay) of the year used in determining benefits multiplied by the ratio of total salary (includes all overtime and other pay) to base salary from the respective preceding twelve-consecutive-month period.

Determining Years of Service Credit (Credited Service) — The number of years that the member has contributed to the employees retirement and benefit fund.

Prior Military Service — A city may provide that members who have been honorably discharged from the military shall receive up to two years prior service credit for military service prior to their employment with the city.

Current Military Service — Any current member who has been on qualified military service in the armed forces of the United States with an honorable discharge may, within six months from his or her date of discharge, be given credit for continuous service in the paid police or fire department.

Any member who has served in active duty with the armed forces of the United States, whether prior to or subsequent to becoming a member of a paid police or fire department, shall receive one additional percent for each year so served in active military duty, up to a maximum of four additional percent.

Absence from the service because of sickness or injury for a period of two years or less shall not be construed as time out of service.

Contributions — Participating employees contribute 7.0% of compensation. Participating employees hired on or after January 1, 2010 contribute 9.5% of compensation. The municipality has elected to contribute the minimum employer contribution under the Alternative funding policy.

Normal Retirement — Members are eligible at the earlier of age 50 with 20 years of credited service or age 65.

Benefit Commencement — Annual retirement pension benefits commence upon retirement or upon the member attaining age fifty, whichever is later, payable in twelve monthly installments.

Summary of Principal Plan Provisions

Actuarial Valuation as of July 1, 2017 (Continued)

Accrued Benefit — The annual retirement benefit equals 60% of average annual compensation, not less than \$6,000, plus an additional percentage of average annual compensation for service over 20 years equal to 2% for each year of service between 20 and 25 and 1% for each year of service between 25 and 30 years. Employees serving in the military are eligible for an additional 1% of average annual compensation for each year of military service up to four years. The maximum benefit is limited to 75% of average annual compensation. Benefits continue for life.

Disability Retirement — Members are eligible after earning five years of service. No service requirement if disability is service related.

The monthly disability benefit equals the greater of 60% of monthly salary at disability or \$500. Employees serving in the military are eligible for an additional benefit of 1% of monthly salary at disability for each year of military service up to four years. Disability benefits, when aggregated with monthly state workers compensation benefits, shall not exceed 100% of the member's monthly compensation at the time of disability. Benefits continue for life or until recovery.

Death Benefits — Members are eligible after earning five years of service. No service requirement if death is service related. Retirees and terminated vested participants are also eligible.

The benefit is equal to 60% of the participant's benefit, but not less than \$300 per month, payable to the spouse until death or remarriage. Other dependents (children, parents, brothers and sisters) are also eligible for death benefits. To each dependent child, 20 percent of the participant's benefit until the child attains eighteen or marries; to each dependent orphaned child, 25 percent of the participant's benefit until the child attains 18 or marries; to each dependent parent, 10 percent of the participant's benefit for life, and to each dependent brother or sister, the sum of fifty dollars per month (but a total not to exceed \$100 per month) until such individual attains the age of eighteen years or marries.

In no case shall the payments to the surviving spouse and children be reduced below 65 percent of the total amount paid to all dependents.

Supplemental Pension Benefits — All retirees, surviving beneficiaries and disability pensioners are eligible for automatic cost-of-living benefits commencing on the first day of July following two years of retirement. The benefits equal the percentage increase in the Consumer Price Index, limited to 4% (2% for some disability retirees), multiplied by the sum of the allowable amount which is the first \$15,000 of the total annual benefits paid and the accumulated supplemental pension amounts for prior years.

Termination Benefits — Any member who terminates employment prior to retirement will be entitled to a refund of contributions without interest.

Refunds — Any member who terminates from their department without receiving a retirement pension shall be refunded all deductions made from his salary, without interest. Any member who receives such a refund and subsequently wishes to reenter the department must repay to the pension fund all sums refunded with interest at the rate of eight percent annual.

SECTION VIII

APPENDIX – PROJECTION DATA

Actuarial Projections – Optional Funding in 2019

Table A-1

Valuation Plan Year End 30-Jun	Number		Total Assets								Actuarial Accrued Liability	Unfunded Liability	Funded Ratio
	Pay Active	Status	Assets (bo)	Benefit Payments	Expenses	Employer Contribs.	Employee Contribs.	Premium Tax		Assets (eoy)			
								Allocation Contribs.	Investment Income				
2017	42	51	\$5,649,638	\$1,223,009	\$7,500	\$1,345,298	\$148,321	\$445,631	\$586,180	\$6,944,559	\$32,233,592	\$25,289,033	22%
2018	37	54	6,944,559	1,262,180	7,706	1,015,700	143,534	442,818	355,431	7,632,156	33,486,270	25,854,114	23%
2019	33	56	7,632,156	1,393,226	7,766	1,881,418	133,720	446,391	407,798	9,100,491	34,587,440	25,486,949	26%
2020	30	59	9,100,491	1,499,503	7,837	1,840,204	126,071	474,944	478,086	10,512,457	35,574,158	25,061,701	30%
2021	26	61	10,512,457	1,608,047	7,922	1,771,160	118,212	491,795	544,519	11,822,174	36,435,965	24,613,791	32%
2022	24	62	11,822,174	1,691,165	8,010	1,696,686	112,335	509,114	606,394	13,047,528	37,206,525	24,158,997	35%
2023	22	62	13,047,528	1,755,998	8,108	1,636,212	109,007	523,818	664,846	14,217,305	37,921,164	23,703,859	37%
2024	19	63	14,217,305	1,835,107	8,210	1,594,465	105,024	538,574	720,613	15,332,663	38,559,856	23,227,193	40%
2025	18	64	15,332,663	1,905,556	8,312	1,550,701	101,317	554,750	773,866	16,399,430	39,129,501	22,730,071	42%
2026	17	64	16,399,430	1,951,098	8,413	1,509,883	99,706	569,255	825,388	17,444,151	39,666,441	22,222,290	44%
2027	16	63	17,444,151	1,983,234	8,513	1,481,706	99,319	583,114	876,465	18,493,008	40,191,578	21,698,570	46%
2028	14	64	18,493,008	2,021,882	8,612	1,461,796	98,072	596,914	927,769	19,547,064	40,691,409	21,144,345	48%
2029	13	64	19,547,064	2,085,478	8,712	1,434,978	94,428	612,884	978,541	20,573,705	41,122,541	20,548,836	50%
2030	12	64	20,573,705	2,148,998	8,809	1,393,042	89,451	629,916	1,027,565	21,555,871	41,475,252	19,919,381	52%
2031	10	64	21,555,871	2,219,905	8,903	1,345,145	83,256	646,870	1,074,002	22,476,336	41,733,407	19,257,071	54%
2032	8	65	22,476,336	2,317,979	8,993	1,291,858	74,097	665,390	1,116,516	23,297,225	41,846,168	18,548,943	56%
2033	7	65	23,297,225	2,406,043	9,075	1,220,661	65,035	686,492	1,153,923	24,008,218	41,816,601	17,808,383	57%
2034	6	64	24,008,218	2,471,797	9,150	1,150,508	58,505	705,068	1,186,412	24,627,764	41,677,336	17,049,572	59%
2035	5	64	24,627,764	2,524,992	9,218	1,093,290	52,286	724,312	1,214,983	25,178,425	41,439,266	16,260,841	61%
2036	3	64	25,178,425	2,610,242	9,280	1,040,758	42,190	743,216	1,239,329	25,624,396	41,046,378	15,421,982	62%
2037	2	63	25,624,396	2,688,874	9,333	970,786	32,127	765,730	1,258,264	25,953,096	40,498,845	14,545,749	64%
2038	2	62	25,953,096	2,717,859	9,377	903,541	26,764	785,113	1,272,668	26,213,946	39,864,589	13,650,643	66%
2039	2	61	26,213,946	2,731,017	9,412	854,257	22,873	805,590	1,284,577	26,440,815	39,163,307	12,722,492	68%
2040	1	60	26,440,815	2,729,383	9,436	811,640	20,344	827,500	1,295,386	26,656,866	38,414,332	11,757,466	69%
2041	1	58	26,656,866	2,717,613	9,450	775,006	18,626	850,140	1,306,092	26,879,667	37,630,142	10,750,475	71%
2042	1	57	26,879,667	2,699,507	9,454	741,336	17,304	874,071	1,317,405	27,120,822	36,817,542	9,696,720	74%
2043	1	55	27,120,822	2,674,455	9,448	709,198	16,465	898,527	1,329,871	27,390,980	35,984,859	8,593,879	76%
2044	1	54	27,390,980	2,665,079	9,433	678,879	13,728	923,426	1,343,410	27,675,910	35,108,086	7,432,176	79%
2045	0	52	27,675,910	2,658,035	9,409	641,397	10,193	950,861	1,357,496	27,968,412	34,179,705	6,211,293	82%
2046	0	51	27,968,412	2,631,237	9,377	601,141	8,351	977,872	1,372,410	28,287,572	33,224,320	4,936,748	85%
2047	0	49	28,287,572	2,607,303	9,336	564,475	6,142	1,005,127	1,388,674	28,635,351	32,236,913	3,601,562	89%
2048	0	48	28,635,351	2,579,564	9,287	526,353	4,110	1,033,858	1,406,467	29,017,288	31,221,011	2,203,723	93%
2049	0	46	29,017,288	2,540,625	9,231	488,069	2,985	1,062,674	1,426,265	29,447,425	30,189,963	742,538	98%
2050	0	45	29,447,425	2,497,693	9,166	17,242	2,139	758,532	1,429,675	29,148,154	29,148,154	0	100%
2051	0	43	29,148,154	2,451,435	9,093	13,084	1,493	0	1,397,005	28,099,208	28,099,208	0	100%
2052	0	42	28,099,208	2,402,081	9,011	11,777	1,040	0	1,345,735	27,046,668	27,046,668	0	100%
2053	0	40	27,046,668	2,350,299	8,921	10,828	716	0	1,294,357	25,993,348	25,993,349	0	100%
2054	0	39	25,993,348	2,297,115	8,822	9,852	397	0	1,242,975	24,940,635	24,940,636	0	100%
2055	0	37	24,940,635	2,241,886	8,715	9,154	181	0	1,191,684	23,891,053	23,891,054	0	100%
2056	0	35	23,891,053	2,184,349	8,598	8,891	121	0	1,140,620	22,847,739	22,847,740	0	100%
2057	0	34	22,847,739	2,125,810	8,471	8,592	49	0	1,089,894	21,811,993	21,811,994	0	100%

Actuarial Projections – Optional Funding in 2019

Table A-2

Employer Contributions

Valuation Plan Year End 30-Jun ^a	Closed Group Payroll	New Entrant Payroll	Total Payroll	Employee Contributions	Gross Normal Cost	Net Employer Normal Cost	Amortization of UAAL	Premium Tax Allocation Contributions	Net Employer Amortization Expenses	Optional Employer Contribution	Statewide Employer Contribution	
2018	\$1,912,017	\$0	\$1,912,017	\$143,534	\$911,837	\$768,303	\$1,551,800	\$446,391	\$1,105,409	\$7,706	\$1,881,418	\$0
2019	1,771,592	156,552	1,928,145	133,720	833,930	700,210	1,607,172	474,944	1,132,228	7,766	1,840,204	16,438
2020	1,661,805	304,380	1,966,185	126,071	774,837	648,766	1,606,352	491,795	1,114,557	7,837	1,771,160	31,960
2021	1,548,304	460,850	2,009,155	118,212	713,164	594,952	1,602,926	509,114	1,093,812	7,922	1,696,686	48,389
2022	1,462,381	628,228	2,090,608	112,335	665,229	552,894	1,599,126	523,818	1,075,308	8,010	1,636,212	65,964
2023	1,412,056	766,119	2,178,175	109,007	637,907	528,900	1,596,030	538,574	1,057,456	8,108	1,594,465	80,443
2024	1,351,936	898,611	2,250,548	105,024	608,094	503,070	1,594,170	554,750	1,039,420	8,210	1,550,701	94,354
2025	1,295,648	1,050,539	2,346,188	101,317	579,915	478,598	1,592,229	569,255	1,022,974	8,312	1,509,883	110,307
2026	1,269,082	1,187,938	2,457,020	99,706	565,768	466,062	1,590,345	583,114	1,007,231	8,413	1,481,706	124,733
2027	1,259,726	1,316,412	2,576,139	99,319	560,220	460,901	1,589,296	596,914	992,382	8,513	1,461,796	138,223
2028	1,237,676	1,441,435	2,679,111	98,072	548,487	450,415	1,588,835	612,884	975,951	8,612	1,434,978	151,351
2029	1,180,932	1,590,418	2,771,351	94,428	520,671	426,243	1,588,003	629,916	958,087	8,712	1,393,042	166,994
2030	1,112,229	1,762,041	2,874,270	89,451	486,623	397,172	1,586,034	646,870	939,164	8,809	1,345,145	185,014
2031	1,031,569	1,937,384	2,968,953	83,256	448,086	364,830	1,583,515	665,390	918,125	8,903	1,291,858	203,425
2032	910,997	2,134,566	3,045,563	74,097	391,669	317,572	1,580,588	686,492	894,096	8,993	1,220,661	224,129
2033	791,952	2,363,063	3,155,015	65,035	335,313	270,278	1,576,223	705,068	871,155	9,075	1,150,508	248,122
2034	703,393	2,574,295	3,277,688	58,505	295,400	236,895	1,571,558	724,312	847,246	9,150	1,093,290	270,301
2035	622,613	2,785,626	3,408,239	52,286	259,057	206,771	1,567,984	743,216	824,768	9,218	1,040,758	292,491
2036	498,925	2,999,761	3,498,686	42,190	204,762	162,572	1,564,664	765,730	798,934	9,280	970,786	314,975
2037	374,882	3,264,593	3,639,474	32,127	151,700	119,573	1,559,749	785,113	774,636	9,333	903,541	342,782
2038	307,861	3,480,746	3,788,608	26,764	122,728	95,964	1,554,506	805,590	748,916	9,377	854,257	365,478
2039	258,926	3,677,086	3,936,012	22,873	101,448	78,575	1,551,154	827,500	723,654	9,412	811,640	386,094
2040	226,657	3,862,894	4,089,550	20,344	87,483	67,139	1,548,571	850,140	698,431	9,436	775,006	405,604
2041	204,564	4,040,131	4,244,696	18,626	77,899	59,273	1,546,684	874,071	672,613	9,450	741,336	424,214
2042	187,450	4,215,986	4,403,435	17,304	70,326	53,022	1,545,249	898,527	646,722	9,454	709,198	442,678
2043	176,423	4,396,038	4,572,460	16,465	65,325	48,860	1,543,996	923,426	620,570	9,448	678,879	461,584
2044	146,285	4,572,195	4,718,481	13,728	53,553	39,825	1,542,999	950,861	592,138	9,433	641,397	480,081
2045	108,339	4,772,445	4,880,784	10,193	38,931	28,738	1,540,865	977,872	562,993	9,409	601,141	501,107
2046	88,330	4,969,923	5,058,253	8,351	31,071	22,720	1,537,505	1,005,127	532,378	9,377	564,475	521,842
2047	64,657	5,166,899	5,231,556	6,142	22,508	16,366	1,534,510	1,033,858	500,652	9,336	526,353	542,524
2048	43,265	5,373,878	5,417,143	4,110	15,143	11,033	1,530,423	1,062,674	467,749	9,287	488,069	564,257
2049	31,416	5,579,789	5,611,206	2,985	10,996	8,011	1,523,716	758,532	431,192	9,231	17,242	^b 585,878
2050	22,518	5,789,675	5,812,194	2,139	7,876	5,737	0	0	0	9,166	13,084	^b 607,916
2051	15,717	6,007,331	6,023,048	1,493	5,486	3,993	0	0	0	9,093	11,777	^b 630,770
2052	10,947	6,229,741	6,240,688	1,040	3,811	2,771	0	0	0	9,011	10,828	^b 654,123
2053	7,532	6,459,932	6,467,463	716	2,621	1,905	0	0	0	8,921	9,852	^b 678,293
2054	4,177	6,702,193	6,706,370	397	1,426	1,029	0	0	0	8,822	9,154	^b 703,730
2055	1,903	6,957,088	6,958,992	181	619	438	0	0	0	8,715	8,891	^b 730,494
2056	1,277	7,219,366	7,220,643	121	415	294	0	0	0	8,598	8,592	^b 758,033
2057	518	7,492,947	7,493,464	49	169	120	0	0	0	8,471	8,335	^b 786,759

^a Assumes employer makes contributions for the applicable valuation plan year in the following fiscal year.

^b Amount required to remain at 100% funded.

Actuarial Projections – Conservation Funding in 2019

Table A-3

Valuation			Total Assets										Actuarial		
Plan	Number		Assets	Benefit	Employer	Employee	Premium Tax			Assets	Accrued	Unfunded	Funded		
	Year End	Pay					Allocation	Investment	Income					Liability	Liability
30-Jun	Active	Status	(boy)	Payments	Expenses	Contribs.	Contribs.	Contribs.		(eoy)	Liability	Liability	Ratio		
2017	42	51	\$5,649,638	\$1,223,009	\$7,500	\$1,345,298	\$148,321	\$445,631	\$586,180	\$6,944,559	\$32,233,592	\$25,289,033	22%		
2018	37	54	6,944,559	1,262,180	7,706	1,015,700	143,534	442,818	355,431	7,632,156	33,486,270	25,854,114	23%		
2019	33	56	7,632,156	1,393,226	7,766	847,455	133,720	446,391	382,264	8,040,994	34,587,440	26,546,446	23%		
2020	30	59	8,040,994	1,499,503	7,837	931,252	126,071	474,944	402,665	8,468,586	35,574,158	27,105,572	24%		
2021	26	61	8,468,586	1,608,047	7,922	1,029,187	118,212	491,795	424,003	8,915,814	36,435,965	27,520,151	24%		
2022	24	62	8,915,814	1,691,165	8,010	1,099,662	112,335	509,114	446,332	9,384,082	37,206,525	27,822,443	25%		
2023	22	62	9,384,082	1,755,998	8,108	1,152,462	109,007	523,818	469,727	9,874,990	37,921,164	28,046,174	26%		
2024	19	63	9,874,990	1,835,107	8,210	1,219,998	105,024	538,574	494,250	10,389,519	38,559,856	28,170,337	27%		
2025	18	64	10,389,519	1,905,556	8,312	1,277,236	101,317	554,750	519,956	10,928,910	39,129,501	28,200,591	28%		
2026	17	64	10,928,910	1,951,098	8,413	1,309,586	99,706	569,255	546,916	11,494,862	39,666,441	28,171,579	29%		
2027	16	63	11,494,862	1,983,234	8,513	1,328,210	99,319	583,114	575,210	12,088,968	40,191,578	28,102,610	30%		
2028	14	64	12,088,968	2,021,882	8,612	1,354,073	98,072	596,914	604,907	12,712,440	40,691,409	27,978,969	31%		
2029	13	64	12,712,440	2,085,478	8,712	1,404,592	94,428	612,884	636,059	13,366,213	41,122,541	27,756,328	33%		
2030	12	64	13,366,213	2,148,998	8,809	1,455,123	89,451	629,916	668,723	14,051,619	41,475,252	27,423,633	34%		
2031	10	64	14,051,619	2,219,905	8,903	1,514,156	83,256	646,870	702,963	14,770,056	41,733,407	26,963,351	35%		
2032	8	65	14,770,056	2,317,979	8,993	1,601,150	74,097	665,390	738,840	15,522,561	41,846,168	26,323,607	37%		
2033	7	65	15,522,561	2,406,043	9,075	1,675,470	65,035	686,492	776,421	16,310,861	41,816,601	25,505,740	39%		
2034	6	64	16,310,861	2,471,797	9,150	1,727,925	58,505	705,068	815,804	17,137,216	41,677,336	24,540,120	41%		
2035	5	64	17,137,216	2,524,992	9,218	1,766,951	52,286	724,312	857,091	18,003,646	41,439,266	23,435,620	43%		
2036	3	64	18,003,646	2,610,242	9,280	1,841,600	42,190	743,216	900,367	18,911,497	41,046,378	22,134,881	46%		
2037	2	63	18,911,497	2,688,874	9,333	1,905,973	32,127	765,730	945,714	19,862,834	40,498,845	20,636,011	49%		
2038	2	62	19,862,834	2,717,859	9,377	1,919,977	26,764	785,113	993,256	20,860,708	39,864,589	19,003,881	52%		
2039	2	61	20,860,708	2,731,017	9,412	1,915,850	22,873	805,590	1,043,131	21,907,723	39,163,307	17,255,584	56%		
2040	1	60	21,907,723	2,729,383	9,436	1,894,375	20,344	827,500	1,095,470	23,006,593	38,414,332	15,407,739	60%		
2041	1	58	23,006,593	2,717,613	9,450	1,861,365	18,626	850,140	1,150,405	24,160,066	37,630,142	13,470,076	64%		
2042	1	57	24,160,066	2,699,507	9,454	1,820,398	17,304	874,071	1,208,073	25,370,951	36,817,542	11,446,591	69%		
2043	1	55	25,370,951	2,674,455	9,448	1,771,557	16,465	898,527	1,268,613	26,642,210	35,984,859	9,342,649	74%		
2044	1	54	26,642,210	2,665,079	9,433	1,739,552	13,728	923,426	1,332,165	27,976,569	35,108,086	7,131,517	80%		
2045	0	52	27,976,569	2,658,035	9,409	1,708,015	10,193	950,861	1,398,869	29,377,063	34,179,705	4,802,642	86%		
2046	0	51	29,377,063	2,631,237	9,377	1,655,716	8,351	977,872	1,468,886	30,847,274	33,224,320	2,377,046	93%		
2047	0	49	30,847,274	2,607,303	9,336	1,456,326	6,142	1,005,127	1,538,683	32,236,913	32,236,913	0	100%		
2048	0	48	32,236,913	2,579,564	9,287	20,321	4,110	0	1,548,517	31,221,010	31,221,011	0	100%		
2049	0	46	31,221,010	2,540,625	9,231	17,242	2,985	0	1,498,581	30,189,963	30,189,963	0	100%		
2050	0	45	30,189,963	2,497,693	9,166	14,900	2,139	0	1,448,012	29,148,155	29,148,154	0	100%		
2051	0	43	29,148,155	2,451,435	9,093	13,084	1,493	0	1,397,005	28,099,209	28,099,208	0	100%		
2052	0	42	28,099,209	2,402,081	9,011	11,777	1,040	0	1,345,735	27,046,669	27,046,668	0	100%		
2053	0	40	27,046,669	2,350,299	8,921	10,828	716	0	1,294,357	25,993,350	25,993,349	0	100%		
2054	0	39	25,993,350	2,297,115	8,822	9,852	397	0	1,242,975	24,940,636	24,940,636	0	100%		
2055	0	37	24,940,636	2,241,886	8,715	9,155	181	0	1,191,684	23,891,055	23,891,054	0	100%		
2056	0	35	23,891,055	2,184,349	8,598	8,890	121	0	1,140,620	22,847,739	22,847,740	0	100%		
2057	0	34	22,847,739	2,125,810	8,471	8,593	49	0	1,089,894	21,811,994	21,811,994	0	100%		

Actuarial Projections – Conservation Funding in 2019

Table A-4

Plan Year End	Benefit Payment Account ^a							Accumulation Account ^b						Statewide Employer Contribution	
	Assets (boy)	Net Benefit Pmts and Expenses	Employer Contribs.	6.01% ^d of Pay Employee Contribs.	100.00% of Premium Tax Allocation	Investment Income	Transfer (To)/From Accumulation Account	Assets (boy) ^c	Net Benefit Pmts and Expenses	Employer Contribs.	1.50% of Pay Employee Contribs.	0.00% of Premium Tax Allocation	Investment Income		
2018	\$6,944,559	\$1,269,886	\$1,015,700	\$143,534	\$442,818	\$355,431	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2019	7,632,156	1,400,992	847,455	107,146	446,391	381,608	(8,013,764)	8,013,764	0	0	26,574	0	656	16,438	
2020	0	1,507,340	931,252	101,144	474,944	0	0	8,040,994	0	0	24,927	0	402,665	31,960	
2021	0	1,615,969	1,029,187	94,987	491,795	0	0	8,468,586	0	0	23,225	0	424,003	48,389	
2022	0	1,699,175	1,099,662	90,399	509,114	0	0	8,915,814	0	0	21,936	0	446,332	65,964	
2023	0	1,764,106	1,152,462	87,826	523,818	0	0	9,384,082	0	0	21,181	0	469,727	80,443	
2024	0	1,843,317	1,219,998	84,745	538,574	0	0	9,874,990	0	0	20,279	0	494,250	94,354	
2025	0	1,913,868	1,277,236	81,882	554,750	0	0	10,389,519	0	0	19,435	0	519,956	110,307	
2026	0	1,959,511	1,309,586	80,670	569,255	0	0	10,928,910	0	0	19,036	0	546,916	124,733	
2027	0	1,991,747	1,328,210	80,423	583,114	0	0	11,494,862	0	0	18,896	0	575,210	138,223	
2028	0	2,030,494	1,354,073	79,507	596,914	0	0	12,088,968	0	0	18,565	0	604,907	151,351	
2029	0	2,094,190	1,404,592	76,714	612,884	0	0	12,712,440	0	0	17,714	0	636,059	166,994	
2030	0	2,157,807	1,455,123	72,768	629,916	0	0	13,366,213	0	0	16,683	0	668,723	185,014	
2031	0	2,228,808	1,514,156	67,782	646,870	0	0	14,051,619	0	0	15,474	0	702,963	203,425	
2032	0	2,326,972	1,601,150	60,432	665,390	0	0	14,770,056	0	0	13,665	0	738,840	224,129	
2033	0	2,415,118	1,675,470	53,156	686,492	0	0	15,522,561	0	0	11,879	0	776,421	248,122	
2034	0	2,480,947	1,727,925	47,954	705,068	0	0	16,310,861	0	0	10,551	0	815,804	270,301	
2035	0	2,534,210	1,766,951	42,947	724,312	0	0	17,137,216	0	0	9,339	0	857,091	292,491	
2036	0	2,619,522	1,841,600	34,706	743,216	0	0	18,003,646	0	0	7,484	0	900,367	314,975	
2037	0	2,698,207	1,905,973	26,504	765,730	0	0	18,911,497	0	0	5,623	0	945,714	342,782	
2038	0	2,727,236	1,919,977	22,146	785,113	0	0	19,862,834	0	0	4,618	0	993,256	365,478	
2039	0	2,740,429	1,915,850	18,989	805,590	0	0	20,860,708	0	0	3,884	0	1,043,131	386,094	
2040	0	2,738,819	1,894,375	16,944	827,500	0	0	21,907,723	0	0	3,400	0	1,095,470	405,604	
2041	0	2,727,063	1,861,365	15,558	850,140	0	0	23,006,593	0	0	3,068	0	1,150,405	424,214	
2042	0	2,708,961	1,820,398	14,492	874,071	0	0	24,160,066	0	0	2,812	0	1,208,073	442,678	
2043	0	2,683,903	1,771,557	13,819	898,527	0	0	25,370,951	0	0	2,646	0	1,268,613	461,584	
2044	0	2,674,512	1,739,552	11,534	923,426	0	0	26,642,210	0	0	2,194	0	1,332,165	480,081	
2045	0	2,667,444	1,708,015	8,568	950,861	0	0	27,976,569	0	0	1,625	0	1,398,869	501,107	
2046	0	2,640,614	1,655,716	7,026	977,872	0	0	29,377,063	0	0	1,325	0	1,468,886	521,842	
2047	0	2,466,625	1,456,326	5,172	1,005,127	0	0	30,847,274	150,014	0	970	0	1,538,683	542,524	
2048	0	0	0	0	0	0	0	32,236,913	2,588,851	20,321	4,110	0	1,548,517	564,257	
2049	0	0	0	0	0	0	0	31,221,010	2,549,856	17,242	2,985	0	1,498,581	585,878	
2050	0	0	0	0	0	0	0	30,189,962	2,506,859	14,900	2,139	0	1,448,012	607,916	
2051	0	0	0	0	0	0	0	29,148,154	2,460,528	13,084	1,493	0	1,397,005	630,770	
2052	0	0	0	0	0	0	0	28,099,208	2,411,092	11,777	1,040	0	1,345,735	654,123	
2053	0	0	0	0	0	0	0	27,046,668	2,359,220	10,828	716	0	1,294,357	678,293	
2054	0	0	0	0	0	0	0	25,993,349	2,305,937	9,852	397	0	1,242,975	703,730	
2055	0	0	0	0	0	0	0	24,940,636	2,250,601	9,155	181	0	1,191,684	730,494	
2056	0	0	0	0	0	0	0	23,891,055	2,192,947	8,890	121	0	1,140,620	758,033	
2057	0	0	0	0	0	0	0	22,847,739	2,134,281	8,593	49	0	1,089,894	786,759	

^a Employer contributions paid from the City's General Fund are used to finance benefits not covered by the applicable employee contributions or premium tax allocation.

^b Assets accumulate in the Pension and Relief Fund.

^c Includes transfer from Benefit Payment Account to Accumulation Account in Plan Year End June 30, 2018

^d Blended employee contribution rate of 7.51% of pay less 1.50% of pay going into the Accumulation Account.

Actuarial Projections – Optional Funding in 2032

Table A-5

Valuation Plan	Total Assets													
	Number		Assets							Premium Tax		Actuarial Accrued Liability	Unfunded Liability	Funded Ratio
	Year End 30-Jun	Pay	Assets (boy)	Benefit Payments	Expenses	Employer Contribs.	Employee Contribs.	Allocation Contribs.	Investment Income	Assets (eoy)				
2017	42	51	\$5,649,638	\$1,223,009	\$7,500	\$1,345,298	\$148,321	\$445,631	\$586,180	\$6,944,559	\$32,233,592	\$25,289,033	22%	
2018	42	54	6,944,559	1,262,180	7,706	1,015,700	143,534	442,818	355,431	7,632,156	33,486,276	25,854,120	23%	
2019	42	56	7,632,156	1,393,226	8,196	1,086,799	149,778	446,391	388,561	8,302,263	34,659,962	26,357,699	24%	
2020	42	59	8,302,263	1,500,108	8,611	1,162,875	156,292	474,944	422,161	9,009,816	35,790,618	26,780,802	25%	
2021	42	61	9,009,816	1,610,182	9,044	1,244,276	163,418	491,795	457,412	9,747,490	36,874,827	27,127,337	26%	
2022	42	62	9,747,490	1,695,648	9,490	1,331,375	173,647	509,114	495,005	10,551,493	37,954,920	27,403,427	28%	
2023	42	63	10,551,493	1,763,428	9,849	1,424,571	183,379	523,818	536,428	11,446,413	39,056,554	27,610,141	29%	
2024	42	64	11,446,413	1,845,907	10,193	1,524,291	192,149	538,574	582,172	12,427,498	40,160,795	27,733,297	31%	
2025	42	64	12,427,498	1,920,128	10,579	1,630,991	203,307	554,750	632,693	13,518,533	41,287,291	27,768,758	33%	
2026	42	64	13,518,533	1,969,800	10,909	1,745,160	214,986	569,255	689,477	14,756,702	42,469,899	27,713,197	35%	
2027	42	64	14,756,702	2,006,481	11,208	1,867,321	227,029	583,114	754,128	16,170,605	43,729,425	27,558,820	37%	
2028	42	64	16,170,605	2,050,154	11,491	1,998,033	237,912	596,914	827,576	17,769,394	45,054,813	27,285,419	39%	
2029	42	64	17,769,394	2,119,201	11,830	2,137,895	248,909	612,884	909,921	19,547,973	46,417,948	26,869,975	42%	
2030	42	65	19,547,973	2,188,714	12,205	2,287,548	260,763	629,916	1,001,533	21,526,814	47,824,339	26,297,525	45%	
2031	42	65	21,526,814	2,266,361	12,568	2,447,676	271,656	646,870	1,103,191	23,717,278	49,265,199	25,547,921	48%	
2032	39	66	23,717,278	2,371,784	12,967	2,512,375	281,822	665,390	1,212,407	26,004,521	50,705,812	24,701,291	51%	
2033	36	66	26,004,521	2,467,872	12,990	2,523,418	277,088	686,492	1,325,073	28,335,729	52,088,577	23,752,848	54%	
2034	34	66	28,335,729	2,541,908	13,026	2,481,280	275,188	705,068	1,439,175	30,681,505	53,447,401	22,765,896	57%	
2035	32	65	30,681,505	2,603,141	13,071	2,443,979	274,148	724,312	1,554,479	33,062,211	54,799,066	21,736,855	60%	
2036	30	65	33,062,211	2,696,196	13,124	2,411,489	269,820	743,216	1,670,772	35,448,188	56,094,532	20,646,344	63%	
2037	28	65	35,448,188	2,782,798	13,179	2,363,634	264,471	765,730	1,787,174	37,833,219	57,341,262	19,508,043	66%	
2038	26	64	37,833,219	2,820,305	13,237	2,322,622	260,715	785,113	1,904,871	40,272,998	58,599,725	18,326,727	69%	
2039	25	64	40,272,998	2,848,329	13,298	2,297,080	255,604	805,590	2,025,914	42,795,560	59,854,924	17,059,364	71%	
2040	23	64	42,795,560	2,883,365	13,359	2,263,270	249,563	827,500	2,150,733	45,389,901	61,094,578	15,704,677	74%	
2041	21	63	45,389,901	2,927,066	13,421	2,218,094	242,269	850,140	2,278,633	48,038,551	62,305,046	14,266,495	77%	
2042	20	63	48,038,551	2,979,169	13,482	2,160,494	234,097	874,071	2,408,744	50,723,305	63,467,433	12,744,128	80%	
2043	18	63	50,723,305	3,038,818	13,543	2,089,562	224,967	898,527	2,540,134	53,424,133	64,572,724	11,148,591	83%	
2044	16	63	53,424,133	3,123,619	13,604	2,009,136	212,283	923,426	2,671,395	56,103,150	65,577,217	9,474,067	86%	
2045	15	63	56,103,150	3,221,140	13,664	1,909,794	197,914	950,861	2,800,806	58,727,721	66,450,091	7,722,370	88%	
2046	13	63	58,727,721	3,310,873	13,723	1,791,741	184,020	977,872	2,927,225	61,283,982	67,201,773	5,917,791	91%	
2047	11	63	61,283,982	3,409,308	13,782	1,660,496	168,307	1,005,127	3,049,650	63,744,472	67,807,463	4,062,991	94%	
2048	10	62	63,744,472	3,513,919	13,839	1,504,706	151,400	1,033,858	3,166,534	66,073,212	68,249,139	2,175,927	97%	
2049	8	62	66,073,212	3,616,911	13,896	1,304,476	133,703	1,062,674	3,275,756	68,219,015	68,520,616	301,601	100%	
2050	7	62	68,219,015	3,722,063	13,951	579,910	114,863	86,154	3,337,974	68,601,902	68,601,903	0	100%	
2051	6	62	68,601,902	3,832,179	14,005	279,727	96,419	0	3,344,403	68,476,267	68,476,267	0	100%	
2052	4	61	68,476,267	3,943,194	14,057	208,556	80,396	0	3,333,225	68,141,192	68,141,192	0	100%	
2053	4	61	68,141,192	4,049,327	14,104	162,191	66,741	0	3,312,367	67,619,060	67,619,060	0	100%	
2054	3	60	67,619,060	4,137,262	14,145	126,452	54,670	0	3,282,906	66,931,681	66,931,681	0	100%	
2055	2	59	66,931,681	4,206,302	14,181	94,172	44,225	0	3,245,776	66,095,371	66,095,371	0	100%	
2056	2	58	66,095,371	4,260,011	14,212	69,125	35,135	0	3,201,791	65,127,200	65,127,200	0	100%	
2057	1	57	65,127,200	4,299,807	14,236	47,006	27,150	0	3,151,655	64,038,968	64,038,968	0	100%	

Actuarial Projections – Optional Funding in 2032

Table A-6

Valuation Plan Year End 30-Jun ^{a,b}	Employer Contributions								Minimum Payment			Statewide Employer Contribution
	Total Payroll	Employee Contributions	Gross Normal Cost	Net Employer Normal Cost	Amortization of UAAL	Premium Tax Allocation Contributions	Net Employer Amortization	Expenses	Optional Employer Contribution	Alternative Employer Contribution	Minimum Employer Contribution	
2018	\$1,912,017	\$143,534	\$911,837	\$768,303	\$1,551,800	\$446,391	\$1,105,409	\$7,706	\$1,881,418	\$1,086,799	\$1,086,799	\$0
2019	1,928,145	149,778	905,295	755,517	1,607,172	474,944	1,132,228	8,196	1,895,941	1,162,875	1,162,875	0
2020	1,966,185	156,292	913,923	757,631	1,661,232	491,795	1,169,437	8,611	1,935,679	1,244,276	1,244,276	0
2021	2,009,155	163,418	924,144	760,726	1,712,878	509,114	1,203,764	9,044	1,973,534	1,331,375	1,331,375	0
2022	2,090,608	173,647	953,307	779,660	1,762,428	523,818	1,238,610	9,490	2,027,760	1,424,571	1,424,571	0
2023	2,178,175	183,379	989,860	806,480	1,810,368	538,574	1,271,794	9,849	2,088,123	1,524,291	1,524,291	0
2024	2,250,548	192,149	1,021,594	829,445	1,856,882	554,750	1,302,132	10,193	2,141,770	1,630,991	1,630,991	0
2025	2,346,188	203,307	1,063,937	860,630	1,901,124	569,255	1,331,869	10,579	2,203,077	1,745,160	1,745,160	0
2026	2,457,020	214,986	1,113,840	898,854	1,942,884	583,114	1,359,770	10,909	2,269,533	1,867,321	1,867,321	0
2027	2,576,139	227,029	1,168,379	941,350	1,981,995	596,914	1,385,081	11,208	2,337,639	1,998,033	1,998,033	0
2028	2,679,111	237,912	1,215,238	977,325	2,017,941	612,884	1,405,057	11,491	2,393,873	2,137,895	2,137,895	0
2029	2,771,351	248,909	1,257,004	1,008,096	2,049,216	629,916	1,419,300	11,830	2,439,225	2,287,548	2,287,548	0
2030	2,874,270	260,763	1,302,976	1,042,213	2,073,923	646,870	1,427,053	12,205	2,481,471	2,447,676	2,447,676	0
2031	2,968,953	271,656	1,346,299	1,074,643	2,090,553	665,390	1,425,163	12,568	2,512,375	2,619,013	2,512,375	0
2032	3,045,563	281,822	1,381,835	1,100,013	2,096,930	686,492	1,410,438	12,967	2,523,418	2,802,344	2,523,418	0
2033	3,155,015	277,088	1,351,418	1,074,330	2,099,028	705,068	1,393,960	12,990	2,481,280	2,998,508	2,481,280	18,530
2034	3,277,688	275,188	1,334,306	1,059,118	2,096,147	724,312	1,371,835	13,026	2,443,979	3,208,404	2,443,979	35,927
2035	3,408,239	274,148	1,322,088	1,047,940	2,093,693	743,216	1,350,477	13,071	2,411,489	3,432,992	2,411,489	53,000
2036	3,498,686	269,820	1,294,478	1,024,658	2,091,582	765,730	1,325,852	13,124	2,363,634	3,673,301	2,363,634	69,759
2037	3,639,474	264,471	1,270,896	1,006,425	2,088,131	785,113	1,303,018	13,179	2,322,622	3,930,432	2,322,622	91,192
2038	3,788,608	260,715	1,265,322	1,004,606	2,084,827	805,590	1,279,237	13,237	2,297,080	4,205,562	2,297,080	108,677
2039	3,936,012	255,604	1,250,568	994,964	2,082,508	827,500	1,255,008	13,298	2,263,270	4,499,951	2,263,270	127,516
2040	4,089,550	249,563	1,227,987	978,424	2,076,451	850,140	1,226,311	13,359	2,218,094	4,814,948	2,218,094	148,375
2041	4,244,696	242,269	1,197,476	955,207	2,065,937	874,071	1,191,866	13,421	2,160,494	5,151,994	2,160,494	170,866
2042	4,403,435	234,097	1,158,070	923,973	2,050,634	898,527	1,152,107	13,482	2,089,562	5,512,634	2,089,562	195,494
2043	4,572,460	224,967	1,114,754	889,788	2,029,231	923,426	1,105,805	13,543	2,009,136	5,898,518	2,009,136	221,971
2044	4,718,481	212,283	1,057,647	845,364	2,001,688	950,861	1,050,827	13,604	1,909,794	6,311,414	1,909,794	249,632
2045	4,880,784	197,914	989,665	791,751	1,964,197	977,872	986,325	13,664	1,791,741	6,753,213	1,791,741	281,650
2046	5,058,253	184,020	924,372	740,352	1,911,548	1,005,127	906,421	13,723	1,660,496	5,625,569	1,660,496	314,361
2047	5,231,556	168,307	853,637	685,331	1,839,452	1,033,858	805,594	13,782	1,504,706	3,628,194	1,504,706	348,364
2048	5,417,143	151,400	778,212	626,812	1,726,499	1,062,674	663,825	13,839	1,304,476	1,598,808	1,304,476	385,023
2049	5,611,206	133,703	699,718	566,015	1,504,497	86,154	411,973	13,896	579,910	579,910	579,910	423,084
2050	5,812,194	114,863	614,298	499,435	0	0	0	13,951	279,727 ^c	279,727	279,727	463,438
2051	6,023,048	96,419	522,511	426,092	0	0	0	14,005	208,556 ^c	208,556	208,556	506,180
2052	6,240,688	80,396	432,809	352,413	0	0	0	14,057	162,191 ^c	162,191	162,191	549,205
2053	6,467,463	66,741	355,943	289,202	0	0	0	14,104	126,452 ^c	126,452	126,452	590,584
2054	6,706,370	54,670	291,246	236,577	0	0	0	14,145	94,172 ^c	94,172	94,172	630,755
2055	6,958,992	44,225	235,459	191,234	0	0	0	14,181	69,125 ^c	69,125	69,125	670,508
2056	7,220,643	35,135	188,380	153,245	0	0	0	14,212	47,006 ^c	47,006	47,006	709,353
2057	7,493,464	27,150	147,634	120,484	0	0	0	14,236	29,323 ^c	29,323	29,323	748,060

^a Assumes sponsor selects Optional funding policy if contributions are lower.

^b Assumes employer makes contributions for the applicable valuation plan year in the following fiscal year.

^c Amount required to remain at 100% funded.

Actuarial Projections – Conservation Funding in 2019

Table A-7

Valuation Plan Year End 30-Jun	Number		Total Assets								Actuarial Accrued Liability	Unfunded Liability	Funded Ratio
	Active	Pay Status	Assets (boy)	Benefit Payments	Expenses	Employer Contribs.	Employee Contribs.	Premium Tax		Assets (eoy)			
								Allocation Contribs.	Investment Income				
2017	42	51	\$5,649,638	\$1,223,009	\$7,500	\$1,345,298	\$148,321	\$445,631	\$586,180	\$6,944,559	\$32,233,592	\$25,289,033	22%
2018	37	54	6,944,559	1,262,180	7,706	1,015,700	143,534	442,818	355,431	7,632,156	33,486,270	25,854,114	23%
2019	33	56	7,632,156	1,393,226	7,766	847,455	133,720	446,391	382,264	8,040,994	34,587,440	26,546,446	23%
2020	30	59	8,040,994	1,499,503	7,837	931,252	126,071	474,944	402,665	8,468,586	35,574,158	27,105,572	24%
2021	26	61	8,468,586	1,608,047	7,922	1,029,187	118,212	491,795	424,003	8,915,814	36,435,965	27,520,151	24%
2022	24	62	8,915,814	1,691,165	8,010	1,099,662	112,335	509,114	446,332	9,384,082	37,206,525	27,822,443	25%
2023	22	62	9,384,082	1,755,998	8,108	1,152,462	109,007	523,818	469,727	9,874,990	37,921,164	28,046,174	26%
2024	19	63	9,874,990	1,835,107	8,210	1,219,998	105,024	538,574	494,250	10,389,519	38,559,856	28,170,337	27%
2025	18	64	10,389,519	1,905,556	8,312	1,277,236	101,317	554,750	519,956	10,928,910	39,129,501	28,200,591	28%
2026	17	64	10,928,910	1,951,098	8,413	1,309,586	99,706	569,255	546,916	11,494,862	39,666,441	28,171,579	29%
2027	16	63	11,494,862	1,983,234	8,513	1,328,210	99,319	583,114	575,210	12,088,968	40,191,578	28,102,610	30%
2028	14	64	12,088,968	2,021,882	8,612	1,354,073	98,072	596,914	604,907	12,712,440	40,691,409	27,978,969	31%
2029	13	64	12,712,440	2,085,478	8,712	1,404,592	94,428	612,884	636,059	13,366,213	41,122,541	27,756,328	33%
2030	12	64	13,366,213	2,148,998	8,809	1,455,123	89,451	629,916	668,723	14,051,619	41,475,252	27,423,633	34%
2031	10	64	14,051,619	2,219,905	8,903	1,514,156	83,256	646,870	702,963	14,770,056	41,733,407	26,963,351	35%
2032	8	65	14,770,056	2,317,979	8,993	1,601,150	74,097	665,390	738,840	15,522,561	41,846,168	26,323,607	37%
2033	7	65	15,522,561	2,406,043	9,075	1,675,470	65,035	686,492	776,421	16,310,861	41,816,601	25,505,740	39%
2034	6	64	16,310,861	2,471,797	9,150	1,727,925	58,505	705,068	815,804	17,137,216	41,677,336	24,540,120	41%
2035	5	64	17,137,216	2,524,992	9,218	1,766,951	52,286	724,312	857,091	18,003,646	41,439,266	23,435,620	43%
2036	3	64	18,003,646	2,610,242	9,280	1,841,600	42,190	743,216	900,367	18,911,497	41,046,378	22,134,881	46%
2037	2	63	18,911,497	2,688,874	9,333	1,905,973	32,127	765,730	945,714	19,862,834	40,498,845	20,636,011	49%
2038	2	62	19,862,834	2,717,859	9,377	1,919,977	26,764	785,113	993,256	20,860,708	39,864,589	19,003,881	52%
2039	2	61	20,860,708	2,731,017	9,412	1,915,850	22,873	805,590	1,043,131	21,907,723	39,163,307	17,255,584	56%
2040	1	60	21,907,723	2,729,383	9,436	1,894,375	20,344	827,500	1,095,470	23,006,593	38,414,332	15,407,739	60%
2041	1	58	23,006,593	2,717,613	9,450	1,861,365	18,626	850,140	1,150,405	24,160,066	37,630,142	13,470,076	64%
2042	1	57	24,160,066	2,699,507	9,454	1,820,398	17,304	874,071	1,208,073	25,370,951	36,817,542	11,446,591	69%
2043	1	55	25,370,951	2,674,455	9,448	1,771,557	16,465	898,527	1,268,613	26,642,210	35,984,859	9,342,649	74%
2044	1	54	26,642,210	2,665,079	9,433	1,739,552	13,728	923,426	1,332,165	27,976,569	35,108,086	7,131,517	80%
2045	0	52	27,976,569	2,658,035	9,409	1,708,015	10,193	950,861	1,398,869	29,377,063	34,179,705	4,802,642	86%
2046	0	51	29,377,063	2,631,237	9,377	1,655,716	8,351	977,872	1,468,886	30,847,274	33,224,320	2,377,046	93%
2047	0	49	30,847,274	2,607,303	9,336	1,456,326	6,142	1,005,127	1,538,683	32,236,913	32,236,913	0	100%
2048	0	48	32,236,913	2,579,564	9,287	20,321	4,110	0	1,548,517	31,221,010	31,221,011	0	100%
2049	0	46	31,221,010	2,540,625	9,231	17,242	2,985	0	1,498,581	30,189,962	30,189,963	0	100%
2050	0	45	30,189,962	2,497,693	9,166	14,900	2,139	0	1,448,012	29,148,154	29,148,154	0	100%
2051	0	43	29,148,154	2,451,435	9,093	13,084	1,493	0	1,397,005	28,099,208	28,099,208	0	100%
2052	0	42	28,099,208	2,402,081	9,011	11,777	1,040	0	1,345,735	27,046,668	27,046,668	0	100%
2053	0	40	27,046,668	2,350,299	8,921	10,828	716	0	1,294,357	25,993,349	25,993,349	0	100%
2054	0	39	25,993,349	2,297,115	8,822	9,852	397	0	1,242,975	24,940,636	24,940,636	0	100%
2055	0	37	24,940,636	2,241,886	8,715	9,155	181	0	1,191,684	23,891,055	23,891,054	0	100%
2056	0	35	23,891,055	2,184,349	8,598	8,890	121	0	1,140,620	22,847,739	22,847,740	0	100%
2057	0	34	22,847,739	2,125,810	8,471	8,593	49	0	1,089,894	21,811,994	21,811,994	0	100%

Actuarial Projections – Conservation Funding in 2019

Table A-8

Plan Year End 30-Jun	Benefit Payment Account ^a						Accumulation Account ^b						Minimum Payment			Statewide Employer Contribution
	Assets (boy)	Net Benefit Pmts and Expenses	Employer Contribs.	5.50% of Pay Employee Contribs.	100.00% of Premium Tax Allocation	Investment Income	Assets (boy) ^c	Net Benefit Pmts and Expenses	Employer Contribs.	1.50% of Pay Employee Contribs.	0.00% of Premium Tax Allocation	Investment Income	Conservation Employer Cont.	Alternative Employer Cont.	Minimum Alt /Cons Cont.	
2018	\$6,944,559	\$1,269,886	\$1,015,700	\$143,534	\$442,818	\$355,431	\$0	\$0	\$0	\$0	\$0	\$0	NA	\$1,015,700	\$1,015,700	\$0
2019	7,632,156	1,400,992	847,455	107,146	446,391	381,608	8,013,764	0	0	26,574	0	656	847,455	1,086,799	847,455	16,438
2020	0	1,507,340	931,252	101,144	474,944	0	8,040,994	0	0	24,927	0	402,665	931,252	1,162,875	931,252	31,960
2021	0	1,615,969	1,029,187	94,987	491,795	0	8,468,586	0	0	23,225	0	424,003	1,029,187	1,244,276	1,029,187	48,389
2022	0	1,699,175	1,099,662	90,399	509,114	0	8,915,814	0	0	21,936	0	446,332	1,099,662	1,331,375	1,099,662	65,964
2023	0	1,764,106	1,152,462	87,826	523,818	0	9,384,082	0	0	21,181	0	469,727	1,152,462	1,424,571	1,152,462	80,443
2024	0	1,843,317	1,219,998	84,745	538,574	0	9,874,990	0	0	20,279	0	494,250	1,219,998	1,524,291	1,219,998	94,354
2025	0	1,913,868	1,277,236	81,882	554,750	0	10,389,519	0	0	19,435	0	519,956	1,277,236	1,630,991	1,277,236	110,307
2026	0	1,959,511	1,309,586	80,670	569,255	0	10,928,910	0	0	19,036	0	546,916	1,309,586	1,745,160	1,309,586	124,733
2027	0	1,991,747	1,328,210	80,423	583,114	0	11,494,862	0	0	18,896	0	575,210	1,328,210	1,867,321	1,328,210	138,223
2028	0	2,030,494	1,354,073	79,507	596,914	0	12,088,968	0	0	18,565	0	604,907	1,354,073	1,998,033	1,354,073	151,351
2029	0	2,094,190	1,404,592	76,714	612,884	0	12,712,440	0	0	17,714	0	636,059	1,404,592	2,137,895	1,404,592	166,994
2030	0	2,157,807	1,455,123	72,768	629,916	0	13,366,213	0	0	16,683	0	668,723	1,455,123	2,287,548	1,455,123	185,014
2031	0	2,228,808	1,514,156	67,782	646,870	0	14,051,619	0	0	15,474	0	702,963	1,514,156	2,447,676	1,514,156	203,425
2032	0	2,326,972	1,601,150	60,432	665,390	0	14,770,056	0	0	13,665	0	738,840	1,601,150	2,619,013	1,601,150	224,129
2033	0	2,415,118	1,675,470	53,156	686,492	0	15,522,561	0	0	11,879	0	776,421	1,675,470	2,802,344	1,675,470	248,122
2034	0	2,480,947	1,727,925	47,954	705,068	0	16,310,861	0	0	10,551	0	815,804	1,727,925	2,998,508	1,727,925	270,301
2035	0	2,534,210	1,766,951	42,947	724,312	0	17,137,216	0	0	9,339	0	857,091	1,766,951	3,208,404	1,766,951	292,491
2036	0	2,619,522	1,841,600	34,706	743,216	0	18,003,646	0	0	7,484	0	900,367	1,841,600	3,432,992	1,841,600	314,975
2037	0	2,698,207	1,905,973	26,504	765,730	0	18,911,497	0	0	5,623	0	945,714	1,905,973	3,673,301	1,905,973	342,782
2038	0	2,727,236	1,919,977	22,146	785,113	0	19,862,834	0	0	4,618	0	993,256	1,919,977	3,930,432	1,919,977	365,478
2039	0	2,740,429	1,915,850	18,989	805,590	0	20,860,708	0	0	3,884	0	1,043,131	1,915,850	4,205,562	1,915,850	386,094
2040	0	2,738,819	1,894,375	16,944	827,500	0	21,907,723	0	0	3,400	0	1,095,470	1,894,375	4,499,951	1,894,375	405,604
2041	0	2,727,063	1,861,365	15,558	850,140	0	23,006,593	0	0	3,068	0	1,150,405	1,861,365	4,814,948	1,861,365	424,214
2042	0	2,708,961	1,820,398	14,492	874,071	0	24,160,066	0	0	2,812	0	1,208,073	1,820,398	5,151,994	1,820,398	442,678
2043	0	2,683,903	1,771,557	13,819	898,527	0	25,370,951	0	0	2,646	0	1,268,613	1,771,557	5,512,634	1,771,557	461,584
2044	0	2,674,512	1,739,552	11,534	923,426	0	26,642,210	0	0	2,194	0	1,332,165	1,739,552	5,898,518	1,739,552	480,081
2045	0	2,667,444	1,708,015	8,568	950,861	0	27,976,569	0	0	1,625	0	1,398,869	1,708,015	6,311,414	1,708,015	501,107
2046	0	2,640,614	1,655,716	7,026	977,872	0	29,377,063	0	0	1,325	0	1,468,886	1,655,716	6,804,716	1,655,716	521,842
2047	0	2,466,625	1,456,326	5,172	1,005,127	0	30,847,274	150,014	0	970	0	1,538,683	1,456,326	7,352,846	1,456,326	542,524
2048	0	0	0	0	0	0	32,236,913	2,588,851	20,321	4,110	0	1,548,517	20,321	7,882,202	20,321	564,257
2049	0	0	0	0	0	0	31,221,010	2,549,856	17,242	2,985	0	1,498,581	17,242	8,380,768	17,242	585,878
2050	0	0	0	0	0	0	30,189,963	2,506,859	14,900	2,139	0	1,448,012	14,900	8,929,907	15,271	607,916
2051	0	0	0	0	0	0	29,148,155	2,460,528	13,084	1,493	0	1,397,005	13,084	9,526,901	13,409	630,770
2052	0	0	0	0	0	0	28,099,209	2,411,092	11,777	1,040	0	1,345,735	11,777	10,172,636	12,073	654,123
2053	0	0	0	0	0	0	27,046,669	2,359,220	10,828	716	0	1,294,357	10,828	10,868,999	11,093	678,293
2054	0	0	0	0	0	0	25,993,350	2,305,937	9,852	397	0	1,242,975	9,852	11,611,974	10,094	703,730
2055	0	0	0	0	0	0	24,940,637	2,250,601	9,155	181	0	1,191,684	9,155	12,403,658	9,379	730,494
2056	0	0	0	0	0	0	23,891,055	2,192,947	8,890	121	0	1,140,620	8,890	13,244,278	9,112	758,033
2057	0	0	0	0	0	0	22,847,740	2,134,281	8,593	49	0	1,089,894	8,593	14,134,172	8,803	786,759

^a Employer contributions paid from the City's General Fund are used to finance benefits not covered by the applicable employee contributions or premium tax allocation.

^b Assets accumulate in the Pension and Relief Fund.

^c Includes transfer from Benefit Payment Account to Accumulation Account in Plan Year End June 30, 2019.